INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC
GUTTA-PERCHA
Reg. U.S. Pat. Off.
Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York

Telephone—Bryant 2576

CABLE ADDRESS: IRWORLD, NEW YORK

Member of the National Publishers' Association

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 70 May 1, 1924 No. 2

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made on application.

REMITTANCES: Should always be made by bank draft, Post Office or Express Money Order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

All Rubber Expeditions Helpful

CURIOUS are the conjectures as to the report soon expected from the Department of Commerce and Prof. H. N. Whitford as to the present and potential status of rubber cultivation and wild rubber as well. Some are skeptical about the practical results and many do not expect much in the way of suggestions that can better market conditions; but it is only fair to give the roving commission the benefit of the doubt, as well as to assume, in the light of experience, that much of the data to be submitted will serve various useful ends.

For nearly two centuries have private and governmental commissions been engaged in similar enterprises, and even the latest one must perforce traverse trails blazed by the hardy pioneers. Back in 1736 M. Charles Marie de la Condamine (1701-1774), sent with MM. Boguer and Godin by Louis XV of France to measure an arc of the meridian near Quito, made exhaustive rubber researches in the upper reaches of the Amazon. In his report to the French Academy of Sciences in 1743, La Condamine gave an excellent description of the "most singular resin, cahout-chou," and the tree from which it was produced. Another expedition sent in 1761 by the same king to study the New World tropics, headed by MM. Herissant and Macquer, confirmed the findings of La Condamine.

Captain J. F. Landolphe (1747-1825), aided by Louis XVI of France, headed an expedition shortly after the American Revolution, sought and found rubber in Africa, organizing a French colony at Benin, Southern Nigeria. It was he after whom the naturalist Beauvois named the rubber-bearing plants known as the *Landolphia owariensis*, *L. hendelotii*, and *L. foretii*.

Dr. James Howison, an English surgeon, found in India in 1789 an "elastic gum vine" yielding caoutchouc and recommended its planting in Bengal, thus getting credit for originating the plantation proposition.

Dr. Jacob Bigelow, an American botanist, leading an expedition in 1852, discovered in Mexico the rubber-bearing shrub guayule.

Robert Cross, leading an English expedition sent to Central America in the early sixties, brought back seedlings of Castilloa; another led by James Collins, who had studied rubber in India, and that had been sent to South America by Sir Clements Markham, head of the British India Office, returned with specimens of Hevea for culture; who also sent Sir (now) Henry A. Wickham to Brazil, where the latter got the Hevea seeds from which sprang the plants that finally made possible the immense rubber plantations of the East Indies.

THE INDIA RUBBER WORLD a dozen years ago took considerable pains to get first-hand knowledge about rubber's habitat and range, and the story of the journeys led by the Editor into the heart of the rubber-yielding countries of both hemispheres swelled the sum of serviceable information regarding the commodity.

C. E. Akers in 1912 headed an expedition fitted out by London and Paris rubber interests and made notable and voluminous reports on the rubber planting possibilities in the Orient and the Amazon Valley.

So, too, should ample credit be given to Paul Preuss who made extensive studies of rubber in South America in 1901; to De Wildeman and Frederick Welwitch for their rubber investigations in Africa; to Manuel V. Ballivan, whose study of the Brazilian rubber situation is a classic of the industry; to Sir William Martin Conway for his valuable data and observations on rubber in Bolivia; as well as to the many others who have conducted important rubber expeditions in the tropics, including

Seiberling, Goodrich, Firestone, Fisk, Hood, Mason, Miller, and the United States rubber companies. The collective value of their reports is inestimable to the industry and the world trade in general. The latest commission is sure to add much to present knowledge.

Stevenson Act Stirs Brazil

EVER since the Stevenson Act for the regulation of exports of crude rubber from the British colonies in the Far East took effect on November 1, 1922, Brazil has watched with keen interest this endeavor to control the operation of the law of supply and demand. But it has not been with a view toward regaining any of its lost ground in the crude rubber market, which it dominated up to seventeen years ago, but rather with its possible application in the solution of regulating its own erratic coffee market. There is in Brazil a growing impression that the Stevenson Act is the most efficient scheme that has ever been devised to control the price and output of a widely used commodity, and even superior to any of the many plans tried or proposed in the South American republic since 1907 for the valorization of coffee. Indeed, so well impressed are many Brazilians with the rubber regulation scheme that they would not only use it, or some modification of the plan, for the benefit of coffee growers, but for the welfare, too, of sugar and cotton growers.

Brazil produces some 70 per cent of the world's supply of coffee, the exports for 1922 being worth over $200,000,000, of which over 50 per cent came to the United States. In the present valorizing scheme not only does the Government help to set the price, but it also buys and stores a large part of the annual crop. When it takes over 5,000,000 bags in one year, as it has done, it corners practically 25 per cent of the world output. When it fixed a minimum export price in the spring of 1921 coffee was selling below production cost, but, as a result of valorization, between March and November the price almost doubled. But short crops, speculation, and excessive planting soon again complicated the situation. The evils the experts had hoped to avert reappeared to plague producers, although many of the latter are now said to be averaging as much as 150 per cent on their investment, a gain which makes the returns of the most fortunate of the Eastern rubber growers seem insignificant in comparison.

In the hope of establishing a settled policy and developing a more enduring method for orderly marketing than has thus far prevailed, the Brazilian Government is now organizing an "Institute for the Permanent Defense of Coffee," and the plan which seems to make the strongest appeal is one which provides not merely a minimum price that should yield a fair profit, but one which would be more or less elastic, conforming to a sliding scale whereby the amount of coffee released for export would automatically increase as the world price rose and correspondingly contract as it fell. Such an arrangement, it is contended, would tend to prevent undue stimulation of production in Brazil and elsewhere which might ensue were an attempt made to maintain a high, rigid price, as well as insure as much success in stabilizing the industry of coffee cultivation as the British scheme has accomplished in steadying the market and reducing the risks of rubber growing.

Rubber Footwear Education

THAT most ancient and beneficial exercise—walking—is getting popular again. President Calvin Coolidge keeps fit with a brisk, early morning walk; Chief Justice William Howard Taft has reduced from 350 to 250 pounds, largely through long walks daily, and many less illustrious have become enthusiastic pedestrians, having found that walking improves health. Even fashionable physicians now tell patients to quit drugs and walk. During the World War millions of men learned that long marches were more helpful than harmful, and since then the rage for walking has grown apace.

Apprehensive perhaps of the growing popularity of rubber footwear, the allied leather trades recently offered large prizes for suggestions designed to enhance the sale of shoe leather. Arguments galore were advanced for the time-honored tanned hide, yet not one, especially bearing on utility, that could not be outmatched with a reason for rubber. For instance, it was claimed that leather shoes are warmer and drier in winter than those of rubber, although common experience confutes such contention. However, the time would seem opportune for makers of rubber footwear to make a concerted effort to place their products in the right light before the shoe-wearing public, which has not yet been taught to properly appreciate the style, comfort, economy, and, above all, health-giving features of modern rubber shoes.

Rubber at the Smithsonian

THE Rubber Association have acquitted themselves wonderfully in the permanent exhibit now installed in the Smithsonian Institution in Washington. Typical specimens of crude and finished product, photographs of processes, lead one from the plantation or forest through the mazes of hand and machine manipulation to completed products in the major lines. With it all, the varied lines are so segregated and arranged that a remarkable simplicity and harmony are present. Thus has been created the first visual symposium of the rubber industry. Its present and future educational value is very great. The committee of arrangement, the many contributors and the Association as a whole may well feel proud of their work.

"GIVE TO EVERY MAN THAT ASKETH OF THEE; AND of him that taketh away thy goods ask them not again." Luke 6:30.

Balloon Tire Shoes Pinching Car Makers and Dealers

Effect on Automobile Industry of Sudden Popular Demand for New Equipment—How the Trouble Can Be Relieved—Need of Standardization on a Few Tire Sizes

By H. P. Wilkin

THERE appears to be considerable concern among some automobile manufacturers and dealers over the unexpectedly sudden and large demand by the public for balloon tires this season.

Where the Shoe Pinches

Where the shoe pinches is in the fact that the large volume of this demand could not be foreseen and provided for last summer, and that, as a consequence, most cars were designed for the former standard wheel and tire equipment, and the wheels, rims, and tires ordered. Steering gears, fenders, springs and other parts had all been designed for the usual high pressure tires, and speedometer-odometer instruments were geared for them. Even more important, engine speeds and gear ratios were calculated on the basis of standard wheels and tires and the weight and strength of all chassis parts were based on inflation pressures of forty to seventy pounds.

Car dealers throughout the country have already been stocked with new cars in anticipation of big spring sales, but, unfortunately for dealer and manufacturer, a considerable percentage of prospective buyers are asking for balloon tires. Reports indicate that the cars furnished with balloon tires as standard equipment will not nearly supply the demand and that, where balloons are offered as optional equipment, the wheel, rim and tire makers will be unable to supply these in sufficient quantities this season. Even if they can, it means that much of the wheel equipment already shipped to dealers on cars will have to be removed to substitute balloon tires made for 20 and 21-inch wheels and rims, and neither the dealer nor the car manufacturer is willing to absorb such a loss.

It is an awkward situation for which the car makers and dealers are disposed to blame the tire companies, holding that the balloon tires should not have been advertised until later in the season.

In the circumstances, apparently the best way out is for the car dealers to fit balloon tires on the wheels and rims already on the cars, thereby obviating any loss on wheels and rims. That seems to be the obvious thing to do and would relieve the situation all around.

Balloon Type Tires Not Ideal Equipment

Granted that the combination of balloon tires and present wheels is not ideal equipment on all cars, at least it will give greater riding ease than the high pressure tires and satisfy most customers. The "balloon type" tires, as the interchangeable balloons for existing rims are termed, give all the advantages of the balloon tires for small diameter wheels, such as better traction, reduction of skidding, higher average running speed, less driving strain and bodily fatigue, and consequently the cost of car repairs and depreciation is reduced.

Most of the large tire companies and many of the smaller ones are now making this type of balloon tires, or soon will be doing so. The interchangeable balloons will therefore be available in large volume to supplement the balloons for 20 and 21-inch wheels. If the car dealer offers his customers a choice between taking a set of these at the price of the tires less a deduction for the high pressure equipment tires and a set of small diameter balloons at an extra cost sufficient to cover the special wheels, many buyers will take the former and the dealer and car manufacturer will not sustain any loss.

Some automobile manufacturers are opposed to the removal of equipment tires and the substitution of others, especially of balloon type tires to fit wheels and rims on the cars already made and shipped. The public, however, is going to decide the matter, for the dealer must give the purchaser what he wants or go out of business.

Opposition of Car Manufacturers

It is a rather safe assumption that the opposition of the car manufacturer is founded on what he conceives to be good business reasons, but the reasons given to his dealers are that the "balloon type" tires will not fit the cars, the fenders will rub, steering will be interfered with, power of the car will be cut down and gasoline consumption increased. These objections are being passed on to automobile purchasers, and in some cases may persuade them to take the regular high pressure equipment instead of insisting on balloons, but at the same time the arguments are tending to create doubt regarding all kinds of balloon tires and may react unpleasantly later.

The criticisms made are not true of balloon type tires as applied to the majority of cars. They are mostly theoretical and made by persons who have not ridden in cars fitted with them and do not really know whether their statements are true or false. Thousands of cars of most of the popular makes now in the hands of users are already being run on balloon type tires, and the owners are enthusiastic in praise of the improved riding and driving qualities. If any difficulties arise with the new tires they can, in most cases, be overcome easily in one of several ways. The car engineers and service men themselves can suggest remedies if they are disposed to do so—and will if the car manufacturer and his dealers come to the conclusion that it is in the interest of good business to furnish these tires for the cars now in the dealers' hands or that cannot be equipped at the factory with small diameter wheels and balloon tires to fit them. After all, what alternative has the automobile dealer if the manufacturer is unable to secure all the special wheels and tires demanded and the dealer's customers insist on having balloon tires?

Objections Mainly Theoretical

It was said that some of the objections raised against balloon type tires were theoretical instead of being based on actual knowledge. The basis of most of this criticism undoubtedly is the greatly increased overall diameter of the tires as compared with the standard tires they replace. This is a rather natural error which arises from overlooking the greater deflection of the low pressure tire. Whereas the ordinary tire has a deflection of only 10 to 12 per cent of its sectional diameter, the balloon tire has a deflection of 22 per cent or more, so that its effective driving diameter is very little more. As a matter of fact, the distance from the center of the drive axle to the road through a 24-inch wheel fitted with a 34 by 5.77 balloon tire is only about half an inch longer than the distance through the same wheel fitted with a high pressure 32 by 4½-inch tire. This is just about the difference that is made when an oversize high pressure cord is substituted for the regular size. Nothing was heard about loss of power or increased gasoline consumption when oversizing became gen-

eral. Nor was objection raised that the oversize tires raised the car higher from the road or that the cars could not be turned so short.

Now, when a 5.77 is substituted for a 4-inch tire, double oversizing occurs and the driving radius is increased about an inch, or approximately 6 per cent, which may have a perceptible effect on hill climbing power. There is compensation for this loss of power on hills, however, in the fact that on the level the car can be driven faster at the same engine speed, because the effective rolling circumference of the balloon tire is 6 inches greater and there is less wear on the engine.

Assume that a car is geared 4 to 1 and fitted with 32 by 4 high pressure tires. The rolling circumference of the wheel is approximately 100 inches. It turns, theoretically, 633 times in a mile and the engine makes 2,534 revolutions. The same car fitted with 34 by 5.77 balloons turns the wheels only 593 times in a mile and the engine only 2,374 times. There is a saving of 40 wheel revolutions and 160 engine revolutions, which obviously reduces wear on both the tires and the engine. So far as the engine is concerned, it is not the number of revolutions per mile but the number per minute that determines rapidity of wear. At 40 miles an hour the engine would make 1,690 r. p. m. on 4-inch high pressure tires and only 1,582 r. p. m. on the 5.77 balloon tires. Actually, there is a greater difference in wheel and engine revolutions, because the high pressure tires rebound from the road after striking obstacles and are out of contact with the surface an appreciable percentage of the time in ordinary driving and accelerate while in the air, resulting in slippage, whereas the balloon tires stay in contact with the road practically all the time, so that all the driving effort of the engine is delivered in forward propulsion. In short, there is less actual "loss of power" with the balloons than with the high pressure tires, although the ability to climb hills may be slightly less because the power leverage from the axle to the road is a little longer.

Gas Consumption Reduced

Instead of gas consumption being increased it should be lessened, since there is a saving of 160 cylinder charges per mile (with a four cylinder engine in the comparison just made), and there is less driving in intermediate and low gear in bad going. Whether or not there is a saving is still a moot question. Users of balloon type tires disagree, and there have not yet been any scientific tests to determine the point. Fuel consumption is of much less importance, however, than the increase in riding luxury, saving of driving fatigue and saving in car repairs and depreciation.

The Question of Clearances

The most important question is that of clearances for the tires. The fenders of some cars are so close to the present tire equipment that when tires an inch or more larger in sectional diameter are fitted the fenders strike the tires when heavy bumps are hit and the car springs are depressed to the limit permitted by the rubber bumpers. This certainly is objectionable even though most driving is done on good roads, and on bad ones a slow speed will avoid it. This objection is not encountered nearly so often as would be supposed because while it would be assumed, from the nominal dimensions branded on the tires, that a 6.60 balloon was 1.6 larger than a 5-inch tire, for instance, it actually is only one inch greater in section and the overall diameter of a 5.77, inflated but not under load, is only 1½ inches greater instead of 2 inches.

If, however, the fenders do strike, this can be overcome by inserting an extra spring leaf or by mounting small blocks of steel between the springs and the spring seats on the axles, thereby raising the body and fenders slightly. The extra spring leaves will also stiffen the springs so that they will not be depressed so much, but the additional stiffness will not be objectionable because of the extra cushioning afforded by the low pressure tires.

Steering Resistance

A somewhat greater steering resistance on short turns at slow speed is of minor consequence when it is considered that in straightaway driving and on all ordinary turns at fair speed there is less turning of the steering wheel to avoid small holes and roughnesses. In a day's driving there is less steering fatigue with balloon tires than with high pressure tires, according to the testimony of many users. Some steering gears are being designed now with slower pitch to increase the leverage and make steering easier with balloon tires, particularly as the angle of steering increases.

The Public Will Decide

It remains for the public to decide whether or not the advantages of the balloon type interchangeable tires outweigh their disadvantages. If the decision is in the affirmative, as looks very probable now, car dealers almost surely will find it to their own interest to put the tires on new cars; otherwise they may find that they will lose sales of new cars to customers who will either go to another dealer who will accommodate them or wait another season to buy new cars that leave the factory with balloon tire equipment.

Many car buyers, of course, will not demand balloon tires this season, preferring to wait until others have tried them out, and there will be other buyers who would like to have them but will be easily dissuaded and take cars with high pressure equipment. Nevertheless, a good many sales of cars are likely to be lost this season, from present indications, unless the dealers consent to put balloon type tires on the standard wheels now on the cars.

The somewhat chaotic condition into which the automobile and tire business has been thrown by the development of balloon tires for many sizes of wheels is regrettable. No doubt the desire for low hung cars and the fact that smaller wheels fitted with large section, low pressure tires ride more easily over rough roads than the larger standard wheels fitted with high pressure tires, were responsible for the introduction of two or three new wheel sizes. Still, it seems questionable if the advantages of low suspension and slightly greater steering angle will compensate for the added burden on the industry of the addition of new wheel, rim and tire sizes.

Suggested Standardization

On its face, there do not appear to be any compelling reasons why a single wheel diameter—22 or 23 inches—three widths of rim and five sectional diameters of tires would not serve all necessary requirements for new cars. On a 23-inch rim a 4.40 or 4½-inch balloon tire would give an effective diameter just about the same as a 30-inch, high pressure tire, a 4.95 or 5-inch tire an effective diameter of approximately 31 inches, a 5.77 or 5¾ balloon about 32½ inches, and a 6.60 or 6½ balloon about 33 inches.

With such sizes there would hardly be appreciable differences from the former standard sizes, and what a tremendous economy it would be to car, wheel, rim and tire makers, to tire dealers and to the public if such standardization could actually be brought about!

Until the cars now in use are worn out, in the course of five to ten years, there will be demand for tires to fit them and somebody will supply them so long as it pays to do so. If low pressure tires to fit the rims give real satisfaction, not many owners of these used cars will go to the expense of changing wheels and rims for the sake of putting on balloons of smaller overall diameter, so it looks as if the industry has a long row to hoe. And, unless steps are taken now to standardize and limit the number of wheel, rim and tire sizes within very narrow limits on new cars, the hoeing is not going to be made any easier for the industry in general.

Tire Factory Manufacturing Costs—II[1]

Time Reports—Payroll Calculation—Payroll Analysis—Distribution of the Payroll

By Joseph J. Dawson

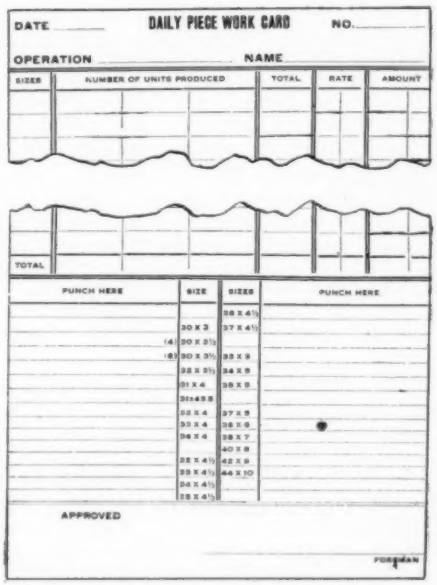
Payroll and Payroll Analysis

THE dependability of the payroll records and the proper distribution of labor contribute largely to the success of the cost system. Poor payroll records distort costs and cause the collapse of otherwise perfectly planned layouts. Great care should be used in establishing the routine for the reporting of time. Particular attention should be given to the classification of direct labor and the tendency to make use of the caption "Indirect Labor" as a "catch-all" account. It is vital that actual figures be used in all cases and that no haphazard estimates or guesses enter into the distribution work.

Reporting Time

Time cards should be issued daily for each employe, whether employed at hourly or piece work rates. These time cards may be printed on both sides, using one side for the hourly workers' form and the other side for the piece-workers' form, thus permitting the use of one type of time card for all employes.

This Side Is Used for Hourly Rate Employes



This Side Is Used for Piece Work Employes

In the modern factory the identity of the individual workman, as affecting the cost and production routine, is inconsequential. Accordingly, individual series of employe numbers should be allotted to each "Production Center." This is a section of the factory where only one operation is performed or where related operations, requiring the same basis of distribution, are performed. The production center will be explained in detail as the work progresses.

Employes should be instructed as to the operation of the time reporting routine. Racks should be provided at the entrances and should contain the current day's time cards ready for the use of employes, at the time of starting work. Upon entering the factory employes should remove their time cards from the rack and after punching them at the entrance clock should take their respective cards with them to their bench or place of work. The last two "Time Report" spaces on the "Daily" side of the time card should always be used for the "In and Out" report.

Day or hourly rate workers should punch the start and stop time for each operation performed, show the operation number and description of the work, and, if the work is done for a production center other than the one to which the employe is assigned, this information should also be given. If the employe is working on a direct labor operation—an operation necessary to the manufacture of the finished product—he should show the number of units produced. This information must be verified by the foreman or department clerk and the card approved.

Piece rate employes must show on their time cards the operation performed, sizes, and the number of units produced. The accuracy of this information must be verified by the inspectors and department clerks and approved by the foreman. All inspectors should be provided with individual punches having a distinctive outline. After the operation has been completed to the entire satisfaction of the inspector he should punch the time card opposite the particular size inspected, thus crediting the employe with one unit of that size and type produced. The total of these punches must check with the number of units produced as shown above. When "Production Reports" are explained, it will be further shown that a supporting piece work stub must be attached to the time card, thus eliminating any possibility of collusion between the inspectors and workmen or any opportunity for fraud.

Employes upon leaving the factory should punch their cards at the entrance clock, depositing them in a conveniently placed drop box. It would be impossible for the employes to return their cards to the racks, inasmuch as the racks should, at this time of the day, contain the new cards for the following day. When new employes are engaged the employment department should provide the first day's card immediately notifying the payroll department so that subsequent cards may be provided.

Payroll Calculation

All time cards should be collected from the drop boxes each morning and immediately sorted by production center and employe number. They should then be extended and the cards for each production center provided with a summary card showing number of week worker or hourly rate cards and the extended value number of piece work cards and the value, and the total amount of payroll chargeable against the particular production center.

After the above work is completed the time cards are checked for accuracy of extension and forwarded to the payroll department for entry on the payroll sheets. These entries are made daily and all totals verified with the information shown on the summary card. This completes the work of the payroll department and the cards are immediately forwarded to the cost department for analysis.

It will be readily seen that the payroll can be closed, cross-

[1] Continued from THE INDIA RUBBER WORLD, April 1, 1924, 436-438.

footed and the coinage cards made up as soon as the last day's time cards are posted to the payroll sheets. The speed with which this work can be completed, by using the method outlined above, eliminates the necessity for "holding back" several days in the payment of employes for labor performed and also reduces inaccuracies caused by speed without purpose, which is the case when the entire payroll has to be calculated at the close of the week. Summary cards should be initialed, in the respective spaces provided, by the employes performing the necessary functions, as they pass through each stage of their progress.

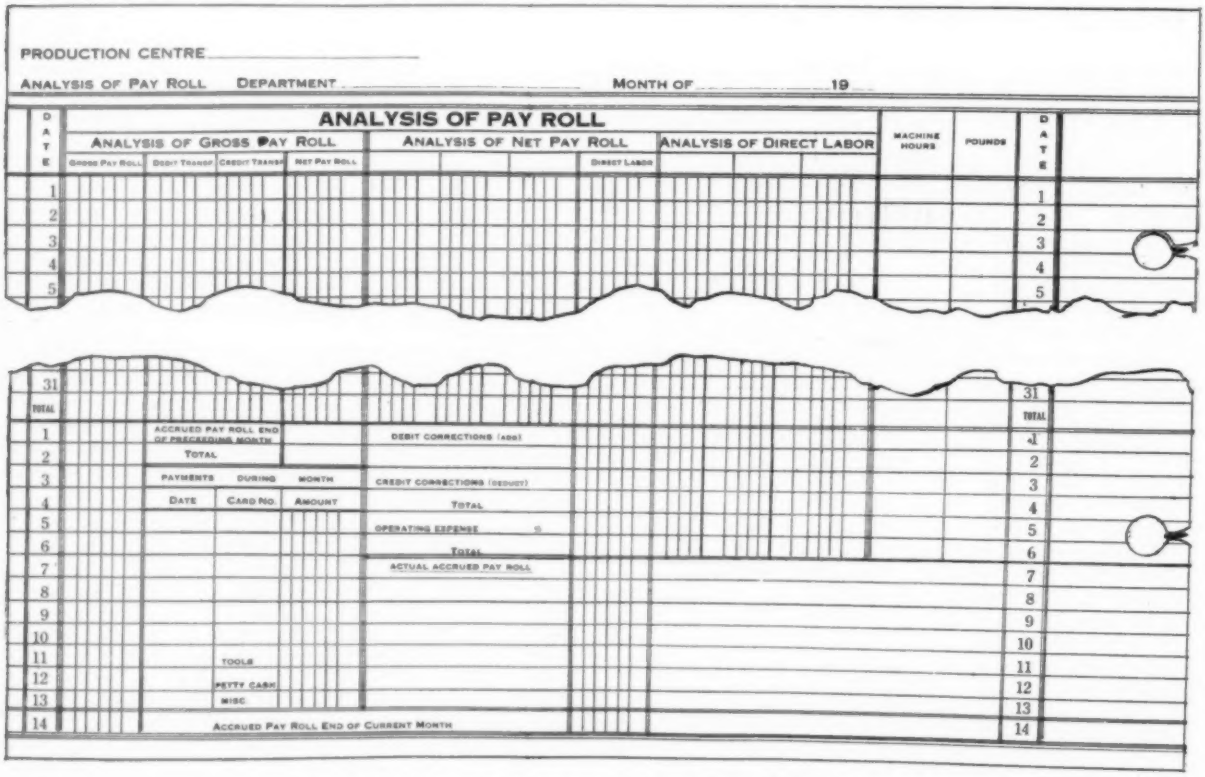
Analyzing the Payroll

We have now reached one of the most vital points in the functioning of the cost system, and its success or failure depends, to a great extent, upon the methods employed in analyzing the payroll and the accuracy and care with which the work is done. This work, as in the case of payroll calculation, must be completed daily, because it is essential that payroll figures be immediately available at the close of the accounting period. Another important reason for daily analysis is the fact that it causes current information regarding irregularities in time reporting and distribution to be brought to the attention of the factory manager or superintendent before the opportune time for their correction has passed.

Every manufacturer, despite the fact that during periods of stringency and reverses when the accounting department is considered an overhead item or liability, points with pride to the fact that manufacturing statements are in his hands seven or eight days after the close of the accounting period. This result is easily accomplished if the analysis of payroll and preparation of production statistics, upon which the efficiency of the cost system depends, keep pace with the work of the manufacturing departments.

As soon as the time cards are delivered to the cost department by the payroll department the work of analyzing should commence. The total or gross payroll for each production center as shown by the summary card is entered on the analysis sheet. Isolation of production centers should be maintained by using individual analysis sheets for each center. Debit and credit transfers must be tabulated and posted for each center and the net payroll entered in the column provided. This work is very important because many items of overhead are not constant for all departments and it would be unfair to use overhead rates applicable to a given center where, as a matter of fact, a vast majority of the labor charged was performed in a center wherein the overhead charge actually represented a considerably higher or lower rate.

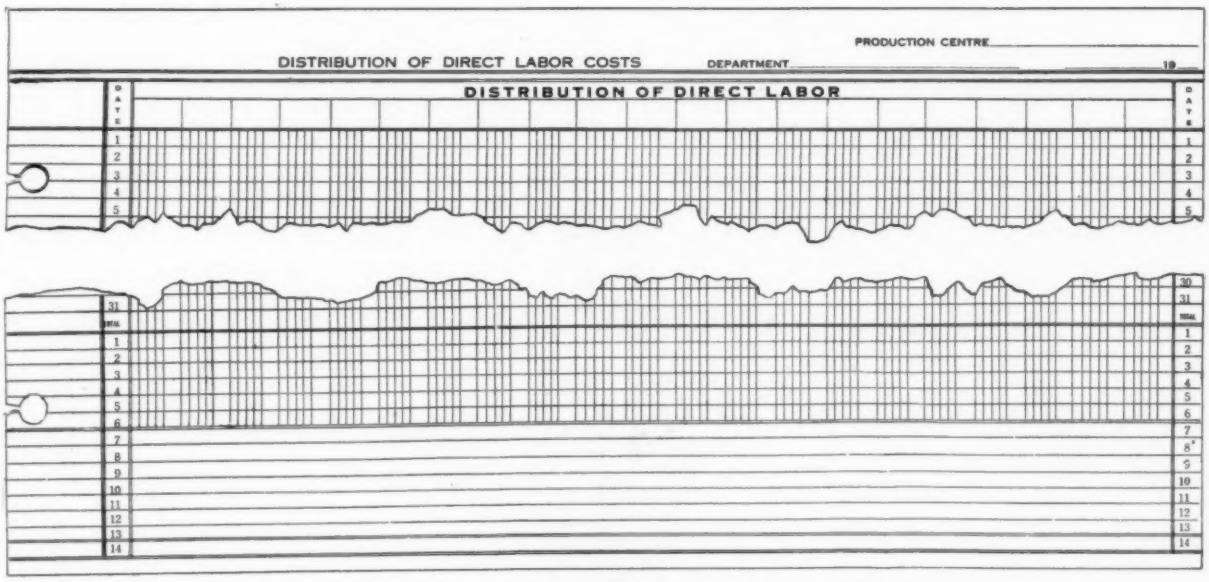
Credit transfers are charges for labor performed by the center being analyzed for other centers, and debit transfers are charges for labor performed by all other centers for the one being analyzed. The former are posted as credits to the center being analyzed and as debits to the individual centers to which it applies. The latter are posted as debits to the center being analyzed and are included in the credit posting of the center from which they come. It is well, before making any postings on the various analysis sheets, to compile a summary of all transfers and to show on the summary cards the amounts to be added or deducted and the centers affected. The gross payroll plus the debit transfers, less the credit transfers, gives the net payroll. After the net payroll has been determined, indirect items such as supervision, clerking, inspection, service, indirect labor, etc., are entered and deducted from the net payroll to determine the direct labor. As soon as this figure is arrived at the actual work of analysis is completed. The next step in the work necessary to make the payroll figures of value to the cost system is the distribution of the direct labor.



For General Payroll Analysis and Accrued Payroll Record

When the analysis of the payroll is completed the accrued payroll as shown by the general books should equal the total accrued payroll of all production centers as shown by the analysis

figures. This accrued payroll for each production center is determined by adding the accrued, as shown at the end of the previous accounting period, to the total gross payroll, as shown by the analysis, and from this result deducting the total payroll actually paid during the accounting period, as shown by the coinage cards. Incidentally, the accrued figures should equal the gross payroll for the actual days making up the accrual period.



For Distribution of Direct Labor Insert Operations at Top of Columns

Payroll Distribution

All direct labor must be accounted for and distributed as actually performed. Distribution figures must never be forced or estimated. In case of any doubt they should be traced back and verified.

The following brief outline, based on practical study of rubber conditions by the writer may prove valuable as an aid in establishing a basis for distribution.

Washing—By kinds of rubber washed.
Drying—By kinds of rubber dried.
Compounding—By compounds weighed out.
Milling—By compounds milled.
Calendering—By fabrics dried and prepared for calendering.
By friction stock calendered.
By friction stock skim-coated.
By gum stock calendered.
Treads—By sizes of treads run.
Beads—By bead sizes made.
By bead sizes cured.
Cutting—By kinds and sizes of stock cut.
Assembling—By sizes of tires assembled.
Tire Building—By sizes of tires built.
Vulcanizing—By tires cured.
By air bags cured.
Finishing—By sizes of tires inspected.
By sizes of tires wrapped.
Tubes—By sizes and kinds rolled.
By sizes and kinds spliced.
By sizes and kinds packed.
Air Bags—By sizes made.
Flaps—By sizes made.

The foregoing is advanced as a matter of suggestion and may be elaborated upon as specific cases and conditions warrant, but once a definite routine is established it must be maintained in its entirety and no deviation permitted under any circumstances. If this course is pursued the results will be most satisfactory, but if the routine is continually changed or tampered with the costs resulting from such conditions will not be dependable and the entire system will be doomed to failure.

"Production Reports" will be the next subject covered by this series of articles on tire factory cost systems.

SPRING MEETING OF A.S.M.E. TO BE HELD IN CLEVELAND

The spring meeting of The American Society of Mechanical Engineers will be held this year from May 26 to 29 at Cleveland, Ohio, the Hotel Cleveland having been chosen as headquarters. An interesting and varied program has been prepared, which includes a visit during the first day of the convention to Akron, Ohio, where inspection trips will be taken through some of the important rubber factories of that city.

N.A.C.C. APPOINTS BALLOON TIRE COMMITTEE

At the April meeting of the National Automobile Chamber of Commerce a special committee was appointed to work with other agencies of the industry in regard to the subject of balloon tires. Definite standards for such casings are to be considered, and engineers and tire makers will be consulted as to their proper use. As soon as possible the committee will meet with such bodies as the Rubber Association of America and with the standards committee of the Society of Automotive Engineers.

SUMMER MEETING OF S. A. E.

The summer meeting of the Society of Automotive Engineers will be held this year from June 24 to 27 at Spring Lake, New Jersey. Three of the hotels at this resort are to be utilized, the Monmouth Hotel for meetings and as headquarters, and the Essex and Sussex hotels to provide supplementary accommodations for members and guests.

Abrasive Testing of Rubber Goods[1]

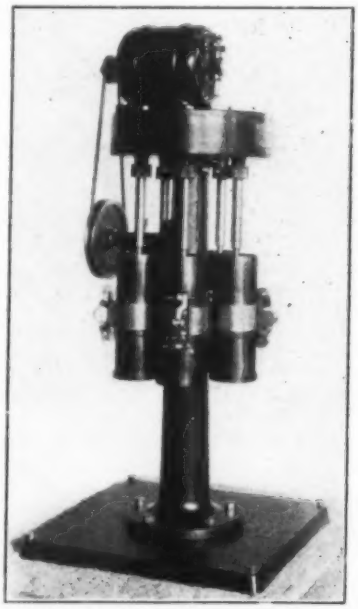
The Goodrich Abrasion Tester—Method of Making Tests

THE ability of a rubber composition to withstand the abrasive wear which it will encounter in service is a matter of special importance in connection with such service as is reasonably expected from solid tires, automobile tire treads, soles, heels, conveyor belting and other heavy duty service. Various means have been employed for making comparisons of rubber compounds in respect to their wear resisting quality, and one of the most successful of methods is here described.

Goodrich Abrasion Tester

The abrasion tester shown in the accompanying illustration is designed to test ring specimens of rubber or similar substances by revolving them in loose abrasive materials. It has five spindles which will take five specimens each or a total of twenty-five pieces, and comparisons are obtained by determining the loss of weight after a period of grinding.

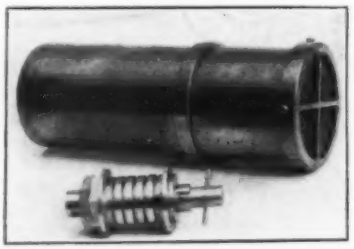
The machine may be placed on a bench or table and is made for belt or motor drive. To overcome interference in operating and loading, it is constructed with a cast-iron central column which is mounted on a square cast-iron base and supports a gear case containing the operating mechanism. At the back of the column is a bracket carrying the main driving shaft, on the outer end of which is a belt pulley. When arranged for motor drive as illustrated the motor is mounted on top of the gear box and the drive made by an endless flat belt. On the other end of the horizontal shaft is a miter gear with its mate on a vertical shaft inside the column.



The Goodrich Abrasion Testing Machine

The vertical shaft operates a central spur gear in the center of the gear case which meshes with five spur gears on the five spindles. These gears rest on ball thrust bearings and the box is packed with grease. Stuffing boxes are provided on the spindles where they project below the gear box, thus preventing leakage of grease and dust proofing the moving parts.

About midway of the column and fastened rigidly to it are the can holders, which are of bronze. The cans are of heavy steel and at their lower end is a brass cap holding in position a bronze wire screen supported by knife-edge cross ribs on the bottom. Part way up on the can is a ring or stop arranged so that the cans will always be placed in the machine in the same position. Two rollers on links provide the means for holding the cans in position. This construction permits the cans to be placed in position or removed without the use of tools or thumb screws.



Abrasion Container and Sample Holder

The five spindles are reduced from ¾-inch diameter to ½-inch diameter just above the point at which they enter the cans. The specimen holder consists of a steel barrel on which are two washers and four spacing collars. This permits five circular rings stamped from sheets to be placed on each holder. They are compressed and held in proper position by two hexagon nuts which can be securely locked by wrenches. This holder when loaded slips over the end of the spindle and locks by means of a pin in the spindle and a bayonet lock in the holder. By the same method an agitator is attached to the lower end of the holder and has a beveled cross blade held by means of a headless set screw in the end of the shaft. This permits the use of various types of blades, the blade being set at any angle desired. This construction allows the holder to be reversed almost instantly, and the agitator will fit either end of the holder. The machine is designed with sufficient space under the cans for removing them without danger of striking the screen on the bottom. There is also ample space above the cans to permit filling with abrasive material without difficulty.

Although expensive, this design gives a very rigid and substantial construction capable of long and satisfactory service. It is noiseless and operates smoothly and with practically no vibration. All gears are enclosed and run in grease and all bearings and working parts are designed with a large factor of safety. So far as possible all moving parts are protected from dust and grit and the machine is built for continuous service with minimum care.

Method of Test

The following details concerning the method of using this abrasive tester are quoted from a paper by W. W. Evans[2].

For one mandrel, five test rings are prepared and weighed, and placed on the mandrel. Four of these are of the unknown compositions and one standard. The mandrel is fastened to the end of the rotating shaft, the abrasive can put in place and filled to the proper level, and the machine started. This operates at the approximate speed of 130 r. p. m. The test requires about eight hours. At the end of four hours, the machine is stopped and the mandrel reversed in its position, so that the two bottom rings are now the top rings. This gives all samples equal static head for the same period of time during the test. It is also desirable to replace the abrasive with fresh material. A typical series of tests is recorded in Table I.

The samples are again weighed after the test, the loss determined and converted to an index number. The percentage loss of the standard compound is taken as 1,000. The percentage loss of each experimental compound on the mandrel is divided into the percentage loss of the standard compound and multiplied by 1,000. A compound with an index number of 1,100 is accordingly better than the standard compound in resisting abrasion, and one with an index number of 900 is not as good as the standard. It is unnecessary to obtain the specific gravity or the volume loss of each compound, since the percentage loss in weight is the same as the percentage loss in volume. Experience indicates that it is necessary to wear away 15 to 20 per cent of the original volume of the sample, in order to obtain consistent results.

[1] Written from information furnished by The B. F. Goodrich Co., Akron, Ohio.

[2] Development manager, The B. F. Goodrich Co., Akron, Ohio. Paper read at the twenty-sixth annual meeting of the American Society for Testing Materials, at Atlantic City, New Jersey, June 25-29, 1923.

One source of error is the difference in thickness of the test samples. Molded sheets used for this purpose are found to vary from 0.080 to 0.120 inch in thickness. The total area of rubber exposed to the abrasive on a sample 0.080 inch thick is 1.114 square inch, and that for a sample 0.120 inch thick is 1.135 square inch. The difference is 0.021 square inch or 1.88 per cent (based on thickness of 0.080 inch).

TABLE 1. SAMPLE TEST CALCULATION OF RESISTANCE TO ABRASION DETERMINATION

Length of Run, 8 Hours; Room Temperature, 86° F.; Average Temperature in Cans, 150° F; Speed of Mandrels, 130 r.p.m.

Compound	Can	Initial Weight, Mg.	Loss in Weight, Mg.	Loss in Weight, Per Cent	Index of Abrasive Resistance
A	No. 1	2,481.0	531.0	21.37	759
B	No. 1	2,714.0	519.0	19.12	848
C	No. 1	2,707.0	509.0	18.81	862
D	No. 1	2,380.0	470.0	19.79	819
Standard	No. 1	2,780.0	450 0	16.22	1,000
E	No. 1	2,634.0	364.0	13.81	337
Standard	No. 1	1,676.0	78.0	4.66	1,000
E	No. 3	2,680.0	385.0	14.37	349
Standard	No. 3	1,637.0	82.0	5.01	1,000
F	No. 2	2,335.0	748.0	32.19	163
Standard	No. 2	1,676.0	88.0	5.25	1,000
F	No. 4	2,440.0	810.0	33.21	166
Standard	No. 4	1,630.0	90.0	5.52	1,000

A test begun in one container should be completed in that container. Eccentricity of the shaft on which the mandrel is fastened will cause different degrees of wear in each container, assuming shafts and mandrels do not run perfectly true.

Some advantages claimed for this abrasion testing machine are as follows:

1. It is reasonably consistent. When a spool is loaded with samples all cut from the same sheet of rubber, the results check very closely.
2. The test samples are small enough to be cut from many finished articles.
3. The volume worn away from any given sample has little, if any, influence upon an adjacent sample.
4. Stiffness is not a factor.
5. Tests may be run in a reasonable time without excessive heating.
6. The abrasive can be screened and used repeatedly.
7. Local variations of the abrasive material, such as occur with abrasive wheels and disks, do not occur with the loose abrasive.

What It Would Cost America to Produce Her Own Rubber

Labor a Bigger Problem Than Location and Climate—Javanese Labor Might Be Obtained for Plantations in the Philippines or Surinam—Problems of Estate Supervision—Extent and Cost of Adequate Plantations—Surinam Possibilities

By D. Kersken[1]

For America to produce her own rubber, as is again being energetically advocated in some quarters, involves not so much a question of location and climate, as many seem to think, as of adequate available labor. Various South American countries within a few days' sailing distance from New York provide sufficient suitable land with the required high temperature and well distributed heavy rainfall for growing rubber, but are so sparsely populated that coolie labor would have to be imported at great expense and difficulty. Much the same is true of the Philippines, where rubber might be grown under the American flag.

Only in southeastern Asia and the East Indies are the right climatic conditions and teeming populations sufficiently intelligent and industrious to be found together. And it is only from there, more especially the Dutch East Indies, that America could hope to obtain the labor and supervision necessary for operating rubber plantations capable of supplying the crude rubber requirements of the United States, wherever such plantations might be established. Although the Dutch Government does not allow Javanese to go outside the country, many Javanese do succeed in going to Malaya, and it is possible that some friendly labor recruiting arrangement could be made between the Dutch and American Governments.

Labor Requirements

What would be the labor requirements of such an undertaking as supplying America with crude rubber? Let us assume that America uses 250,000 tons or 550,000,000 pounds of rubber per year. The average coolie on a plantation 12 years old can bring in every day 20 liters of latex of about 40 per cent, or say about 17 pounds of rubber. His task is 500 trees per day. He works 330 days a year and the yield must be 550,000,000 pounds of rubber. That means 1,700,000 pounds per day, and 100,000 tapping coolies would be needed. Including coolies for other work, plantation factory, fighting tree diseases, etc., the total number would be some 120,000 coolies. Of course when opening up, the full number would not be required all at once, but it would be when the estates are in bearing.

Javanese Labor on Philippine Plantations?

Now the question arises, Would Holland allow America to import labor from Java for plantation work in the Philippines, if America were willing to allow Holland to appoint her own officials to look after a population of 120,000 coolies, who with their families would make about 200,000 Javanese? The officials, of course, would be paid by America. By officials is meant the inspectors of labor, as in Java and Sumatra. For such a number of coolies about five head inspectors and twenty inspectors would probably be sufficient. The Dutch Government would have the satisfaction of knowing that her brown burghers were looked after by people who understand them, and the native would be more willing to go, because he would find there people who would look after his welfare and rights. If such a way could be found it is believed that probably Holland would be willing to allow a certain number of coolies to go to the Philippines for a start.

Problems of Estate Supervision

But there are still other problems. Assuming that America can get labor from Java, who is going to supervise the work? Experienced planters are needed to act as head managers and managers, but assistants are also required. The Javanese will never work under a Filipino assistant or overseer. The two races, apparently so much alike, differ too much. The Javanese sees in the Filipino another native and will become unruly.

To supervise say 50,000 coolies opening up land, 200 trained assistants are needed. To supervise 100,000 tapping coolies, at least 800 trained assistants are needed. This means 62,500 trees per division, which is the maximum. It is impossible to get good work when a man supervises more than 125 tapping coolies.

[1] For many years a rubber planter in Deli, Sumatra, Dutch East Indies.

Whence can a staff of 800 experienced planters, all white men, be secured to act as assistants? Rubber planting is very interesting and young Americans should be the assistants and managers of America's rubber plantations in the future. Taking the number of assistants wanted to be 1,000 and the time for staying in a tropical climate to be twenty years, this will mean that 50 assistants will be necessary every year. Our universities can easily turn out 50 well trained assistants every year. This would mean a special course in tropical forestry, especially concerning the *Hevea brasiliensis*, further a training in the handling of native labor and a knowledge of the Malayan language.

One naturally thinks of employing trained Javanese of higher standing than the ordinary coolie, but a native is a native and very seldom trustworthy. He will cheat the coolies working under him, as experience has shown. Moreover, it is not likely that the Dutch Government would favor the idea of Javanese coolies working under Javanese assistants only, and would insist that white men be employed.

Extent and Cost of 200 Plantations

Some 50,000,000 rubber trees 12 years old are required to yield 550,000,000 pounds of rubber or more. That means 200 rubber estates of 250,000 trees each, or 4,000 acres per estate. It is not advisable to have more than 62 or 63 trees per acre, planted 26 by 26 feet apart. Let us estimate the total costs for one estate of 4,000 acres, from the moment the land is opened up until the estate comes into bearing, to be $400,000. That means $80,000,000 for 200 estates. Itemized details of the estimate follow:

Cost to the Fourth Year

1. Salaries	
First year 60%	$7,481,040
Second year 80%	9,974,720
Third year 100%	12,468,400
Fourth year 100%	14,468,400
2. Depreciation on Buildings	
First year nothing	.....
Second year 3%	397,020
Third year 4%	529,360
Fourth year 5%	661,700
3. Quit Rent	
800,000 acres at say $1 per year per acre over 4 years	3,200,000
4. Interest on Capital	
First year $50,000,000, 5%	2,500,000
Second year $60,000,000, 5%	3,000,000
Third year $70,000,000, 5%	3,500,000
Fourth year $80,000,000, 5%	4,000,000
5. Recruiting, Etc.	
100,000 coolies @ $80	8,000,000
Passage for same @ $20	2,000,000
Reengagement 60,000 @ $2 each	120,000
30,000 returns to Java @ $20 each	600,000
40,000 new coolies @ $80 each	3,200,000
Tips to coolies on Javanese New Year, 100,000 coolies at $0.40 each, $40,000 per year over 4 years	160,000
Cattle to present to coolies on the same occasion, one head per 100 coolies makes 1,000 per year at $60 per head, equals $60,000 per year or for 4 years	240,000
Loss on rice for the coolies taken at $4,000 per estate per year, or for 200 estates $800,000 over 4 years	3,200,000
6. Sundries	
Writing off debts of runaways, burials, insurances, bonuses to the staff, recruiting expenses, staff, contributions, telephones, etc., upkeep buildings, office furniture, stationery all in one lump sum over four years	2,299,360
Total	$80,000,000

Further Costs to the Twelfth Year

When an estate comes into bearing more buildings, factory installations, etc., will be needed. The total cost of these is estimated to be $3,666,000.

Total Cost in Eight Years

Total expenditure for 200 estates the fifth year	$31,271,000
Total expenditure for 200 estates the sixth year	31,535,680
Total expenditure for the following 6 years is estimated to be the same as in the sixth year, or six times $31,535,680	189,214,080
Dividend on $80,000,000 over the last 8 years at 5 per cent per annum, or eight times $4,000,000	32,000,000
Showing a total expenditure over 8 years	$284,020,760

The crop over 8 years is estimated at 2,200,000,000 pounds of rubber. That gives a price per pound of $0.1291. Allowing for the possibility of overlooking sundry items falling on the direct cost of production, it is certain that the cost per pound will not exceed $0.15 per pound.

Surinam Possibilities

The foregoing shows approximately what it would cost to open up 200 estates up to and including the twelfth year, if America could succeed in the Philippines with the aid of Javanese labor. Better chances of success probably exist in Surinam, where conditions generally are perhaps better than in Brazil. Surinam has an area of 160,000 square kilometers, or about 40,000,000 square acres, of which only 66,000 acres are in cultivation. The population is about 115,000. The reason why the present rubber plantations there do not flourish is that the labor (Javanese), which must be imported, is too expensive. This would not be an objection for America. The transport costs for one coolie, estimated to be $20 from Java to the Philippines, would probably be $50 to Surinam.

Certainly Holland would do much to make her Western colony as successful as her Eastern colonies and very likely would meet America gladly if it would invest money in Surinam in the way it did in Sumatra and Java. Probably also there would be no objection to allowing Javanese to go to Surinam under the same conditions as they now go to Deli. The Javanese would have there their own officials and judges, just as they have in Sumatra. Moreover, Surinam young men would probably make good planters and would gladly accept the opportunity. For the more responsible positions it would be easy enough to get trained planters from Java and Sumatra. The cost of importing labor would be higher, but on the other hand it would not be necessary to pay for inspectors of labor, judges, etc.; also, salaries and bonuses would be lower. There are no furloughs to Europe, as the assistants have their relations in the country. Also, freights from Surinam to America would be lower and rubber in liquid form would have a shorter transport.

The estimates presented show where America can be 12 years hence if a start is made now. Of course after 12 years crude rubber consumption in America will be much higher than the estimated 250,000 tons, but with careful tapping and keeping the trees in good condition the yield will increase every year, and once an annual crop of 250,000 tons is reached, even though consumption may be more, America can call herself free from other countries in respect of her rubber supply.

NEW YORK CENTRAL ENLARGES MOTOR TRUCK SYSTEM

The system of motor trucking maintained by the New York Central Railroad to replace local freight trains in the suburbs and metropolitan area of New York City has been recently extended by the establishment of five trucking zones in the western part of the state. In and near Syracuse, Newark (New York), Rochester, Medina, and Buffalo motor trucks are now carrying freight from the above-mentioned points to nearby stations, at Buffalo 28 tractors, trucks and trailers being employed. The railroad is also using motor trucks for terminal service to eliminate trap cars at Erie, Pennsylvania, as well as at Youngstown, Ashtabula, and Cleveland, Ohio. Executives of the company state that surveys are now under way which will lead to the replacement of additional local freight trains by motor trucks on other divisions of the New York Central lines.

INCREASE IN SHIPMENTS OF SOUTH AMERICAN RUBBER

According to reports received by the Department of Commerce, the exports of crude rubber from Pará and Manãos, Brazil, and Iquitos, Peru, for February, 1924, totaled 2,239 long tons, an increase of 863 long tons over total exports of 1,376 long tons in February, 1923.

Machine Molding Hollow Rubber Articles[1]

Angle Molding Press—Molding Process—Angle Press Molds

The ordinary steam platen press and the hand operated molds customarily used in molding and curing rubber articles have serious limitations as equipment for volume production or for molding hollow articles or those with undercut shapes.

In a previous article[2] a description was given of the tilting head press designed for rapid molding of hard plastic materials such as shellac composition, bakelite, etc., the formation of which requires heavy pressure and rapid changes in temperature for fast production. This press with suitable mold equipment has interesting capabilities for volume production in rubber either hard or soft, especially so with stocks compounded for rapid cure by accelerators. The same is true of a second machine, the angle molding

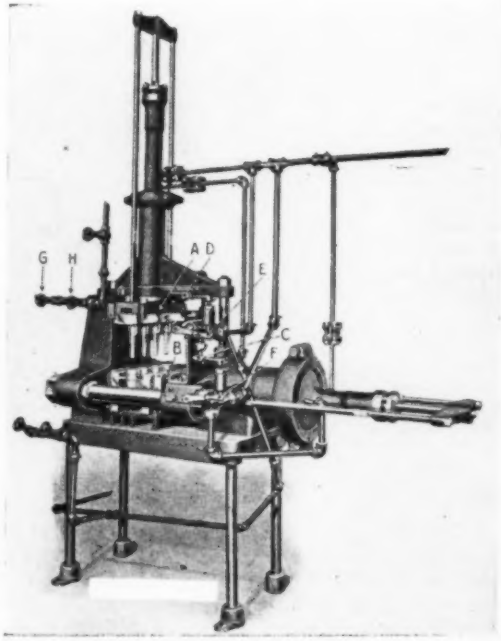


Fig 1.—Angle Molding Press With Molds Open

press, also developed for machine molding hard plastics, especially deep hollow articles with exterior undercuts or projections.

Articles of this sort when made in rubber are ordinarily hand built from sheet stock, and cured either by molding or in open heat wrapped on a core. They can, however, be produced much more satisfactorily by machine molding in an angle press.

The Angle Molding Press

The two forms of angle molding press here illustrated are designed for light and heavy work respectively. In the development of these presses first consideration was given to molding articles that are deep and hollow with threads, bosses, panels, etc., on their exteriors. The formation of articles of this sort is accomplished from crude stock by applying the molding force at right angles to that holding together the two-part mold cavity.

[1]Data and illustrations for this article were furnished by the Burroughs Co., Newark, N. J.

[2]The India Rubber World, January 1, 1923, 216-218, "Manufacture of Hot Molded Hard Plastics."

In Figure 1 the lighter form of angle press is shown equipped as used in the manufacture of telephone receiver shells. The

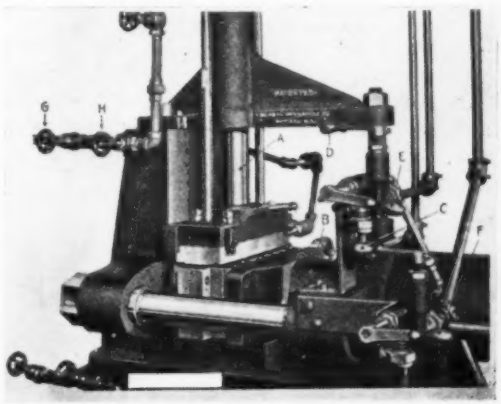


Fig. 2.—Angle Molding Press with Molds Closed

following description is applicable to the formation of a piece of any shape, especially so when it is considered that the relative

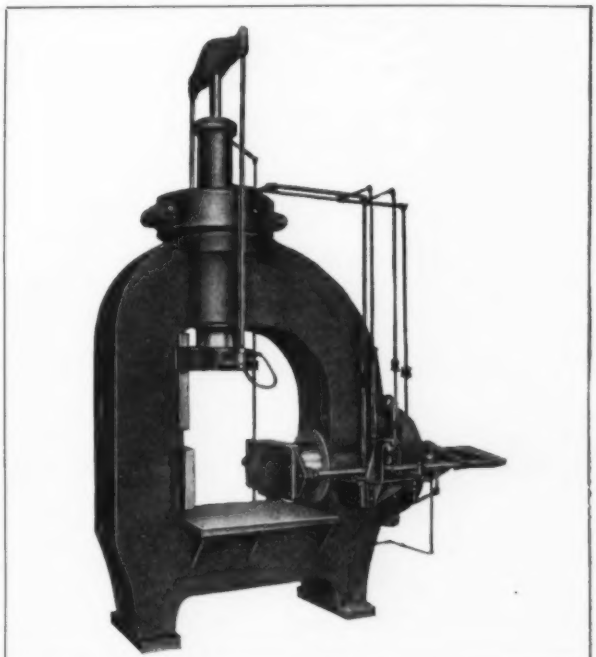


Fig. 3.—Angle Molding Press—150 Tons Capacity for Large and Deep Articles

positions of the rams A and B may be altered and that other hydraulic rams may be added to suit requirements.

The Molding Process

In Figure 1 the press is shown with the coring plungers withdrawn and the mold open. When in this position the molded

pieces are ready for removal. To operate the press the valve C is opened. This causes the horizontal plunger B, having one-half of the mold secured to its face, to travel forward, forcing this half of the mold firmly against the half that is secured to the stationary abutment at the rear of the press. In this closed position the mold cavities are filled with material. Valve D is then opened, causing the vertical plunger A to descend, forcing the cores into the mold cavities and compressing the material as required. (See Figure 2.) Closing valve D and opening valve E causes the withdrawal of the cores. Closing valve C and opening valve F causes the horizontal plunger B to travel back, opening the mold, in which position the finished pieces are readily removable.

The press illustrated in Figures 1 and 2, in open and closed positions, is adapted for molding any small hollow article, but for molding large and deep articles an angle press of the type shown in Figure 3 is required. The latter operates in similar manner

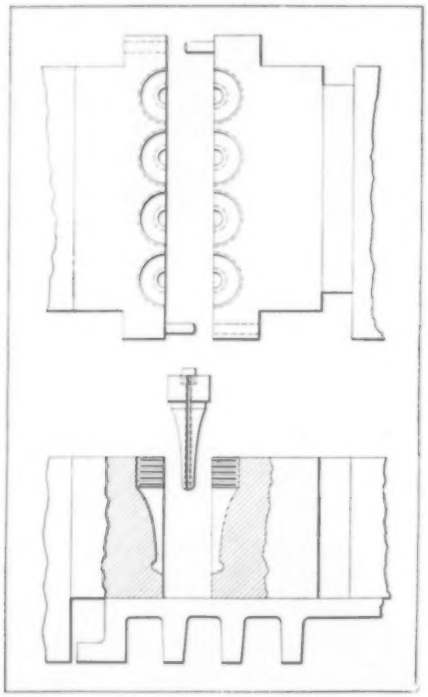


Fig. 4.—Mold for Angle Molding Telephone Receiver Shells

to that already noted. Its frame is made in a single casting sufficiently heavy to resist pressure of 150 tons applied horizontally and vertically to meet the working conditions necessary for molding very deep thin-wall containers or other objects too large and heavy for the lighter press.

Angle Press Molds

An angle press mold of usual construction consists of three principal parts. Two of these constitute the main body of the mold, each containing half cavities of the object to be molded. The third part of the mold is known as the "force." It is the piece which exerts the molding pressure within the mold cavity and shapes the interior of the article.

These parts are clearly shown in Figure 4, which represents an open four-cavity mold for making telephone receiver shells. The parts are shown in relative position as mounted in the angle press. In the upper portion of the figure the two four-cavity parts are represented in plan view. The half on the left is securely attached and bears against a fixed abutment of the press while the half on the right is attached to the head of a horizontally moving hydraulic ram. Each half is doweled to insure registration as the parts close together to form the cavities.

In the lower portion of the figure the same halves are shown between the fixed abutment and horizontal ram, where they rest upon a cast iron bridge piece which serves to prevent the radiation of heat from the mold into the press.

Between the plan and elevations a "force" is represented in position over a mold cavity. The force pieces are attached to the vertically moving ram.

Molds for angle molding are cored around the cavities and also in the core or "force" for circulation of steam or water to control the temperature of the stock during molding.

An angle press mold for a deep and panel-side box like a battery jar is divided so that the cavities open on a plane passing diagonally through them to facilitate the removal of the molded boxes.

GROWTH OF AMERICAN CRUDE RUBBER INDUSTRY

Notwithstanding price fluctuations and comparative falling off in the amount of crude rubber imported in recent months, the industry as a whole continues its steady advance, as indicated by the following figures: In 1921 the United States imported 415,283,304 pounds of crude rubber, value $73,722,677. In 1922 the totals had risen to 674,410,392 pounds, value $101,843,188, while the figures for 1923 are 692,338,607 pounds, value $185,008,303. New York City, of course the largest consumer, took in 1922 646,156,409 pounds, value $97,749,401, the totals rising in 1923 to 647,666,738 pounds, value $172,058,662.

Studying the figures more in detail, one notes that Massachusetts imported in 1923 18,985,444 pounds of crude rubber, an amount more than double her importation for 1922 of 9,430,380 pounds, while the value in 1923, at $5,471,881, was more than four times that of the preceding year, or $1,276,570. The record for the city of San Francisco is somewhat similar, where the amount imported in 1923, or 4,944,930 pounds, is more than double that for 1922, or 2,245,620 pounds. The 1923 value here also is about four times that for 1922, the figures for these years being $1,425,369 and $361,146, respectively. In Los Angeles the amount imported in 1922 totaled 10,385,096 pounds, value $1,520,276. In 1923 the amount declined to 9,154,538 pounds, the value, however, at $2,920,997, being almost double that of the year preceding, or $1,520,276. In Colorado, where the purchases were somewhat intermittent, the amount for 1922 totaled 1,354,062 pounds, value $205,923. In 1923 the amount in this case also, at 2,646,729 pounds, was about double that of 1922, while the value, at $719,856, was more than three times greater. During the two years in question occasional importations were made by Oregon, Michigan, Maryland, Washington, Chicago, Philadelphia, Buffalo, Rochester, New Orleans, and El Paso.

HARVARD BUREAU CONDUCTS TIRE RETAILING SURVEY

At the request of the Rubber Association of America and the National Tire Dealers' Association the Harvard Bureau of Business Research recently instituted a survey of the conditions under which automobile tires are being sold. Statements have been sent to tire dealers throughout the country for the collection of operating expense figures which will be held strictly confidential. Dealers who have furnished data will receive summaries of the investigation, including percentages available for purposes of comparison, average lists of various items of expense, etc.

While the results of the survey are to be used in the work of the Harvard Business School, the information supplied to the individual tire dealer should be of practical assistance in helping him to place his business on a sounder basis. Tire merchants who have not received copies of the profit and loss statement can secure them by writing to the Harvard Bureau of Business Research, Cambridge, Massachusetts.

Rubber Linings for Laboratory Pebble Mills

Unbreakable Rubber Lined Mill Jars Proposed to Replace Fragile, Heavy Porcelain Jars—Numerous Advantages and Dry Grinding Possibilities

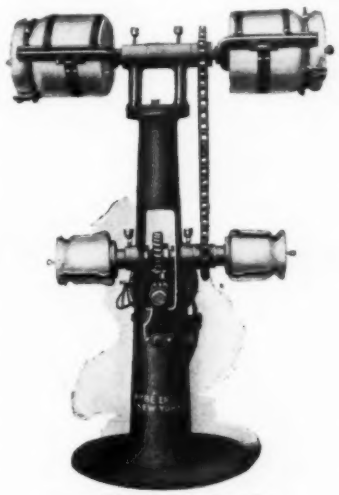
By Edw. W. Lawler

THERE is a field for the application of rubber in the manufacture of jars for small grinding mills to replace the fragile porcelain jars now commonly employed. These small jars are of several sizes and used by the thousands. They are the containers for materials to be finely ground or thoroughly mixed in small pebble or ball mills variously known as sample mills, laboratory mills, jar mills, etc. Flint pebbles or steel balls within the jar do the grinding as the jar is revolved.

Small Grinding Mills and What They Do

The work of these mills is to grind small quantities of chemicals, colors, earths, ores, or other materials to an impalpable powder without bolting. **In mining and assay work,** for example, they grind the samples, and it is therefore important that jars be used which may be thoroughly cleaned between samples, otherwise the next sample will be "salted."

These small grinding mills range from the single and double-jar hand-operated type, with jars containing ¼ ounce to 1½ pounds at a time, to power mills having up to five or even more jars of 1½ to 5 pounds capacity. The advantage of these machines with jars in batteries is that a different material and quantity can be ground in each jar at one operation.



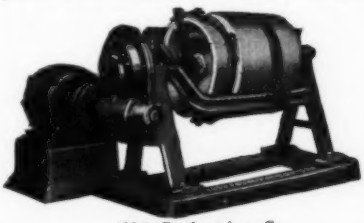
Abbé Engineering Co.

Combination Laboratory Mill

Mills of this sort are used by the United States Geological Survey, and one American ceramic color and chemical manufacturing firm alone has over 250 of these mills in operation. There are also larger single and double power-operated jar mills having jars of 15 to 25 pounds capacity, some of them operating one or two small sample jars at the same time. For still larger mills of 30, 60 and 80 pounds capacity porcelain cylinders with hand holes and covers, and bolted between wooden ends are used.

Porcelain Jars Used As Containers

At present vitrified porcelain jars are used which last for many years so far as ordinary wear is concerned and neither contaminate nor discolor the material being pulverized. But they are heavy and break occasionally if carelessly handled or the pebbles or balls are thrown into them. These jars are held in place by straps of spring steel which sometimes break, also breaking the jar and losing the sample, which may be the only one available. The covers of these jars are ground in but a rubber gasket is used to make them tight. While good jars are made in America the best come from Germany.



Abbé Engineering Co.

Laboratory Mill With Worm Drive and Motor

Rubber Lined Mill Jars Proposed

Progressive rubber manufacturers, operating under the patents on rubber ball mill linings, could probably develop quite a business in unbreakable rubber lined containers to replace these fragile, heavy porcelain jars. These might take the form of a sheet metal can with a removable rubber lining or a thin sheet of rubber cured on the inside of the can. The cover could be either of wood or pressed steel with sheet rubber cured on to the steel or cemented to the wood. These cans might also replace the bottles now used for shipping samples and would be much less fragile.

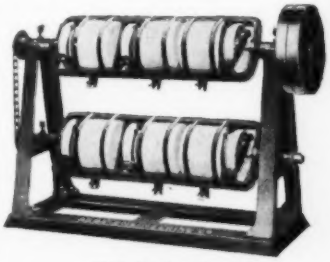
Advantages of Rubber Lined Jars

As rubber is impervious to water and some liquids while porcelain is not, assayers and chemists would prefer the rubber lined containers, and most others would buy them on account of price and ease of handling. Many drug, chemical and ceramic material houses would prefer rubber lined mills to the ordinary ball mills they are now using. The same is true of rubber chemical makers, many of whom now use ball mills to grind colors, contaminating them with flint and cement from the linings and, owing to imperfectly fitting covers, failing to grind all the material.

Sometimes the porcelain jars for these small mills are cemented into metal cans; that is, the jar is set in place and thin Portland cement is poured in until it fills the space between the jar and the can. When the jar cracks or wears out, both the jar and the cement must be broken into small pieces in order to remove them. After a new jar is reset it must not be used for twenty-four hours, in order to permit setting of the cement.

A metal can with a removable rubber lining or container would obviate this troublesome job. Also it would permit one mill to be used for many charges or batches, since each charge as ground could be lifted out of the can in the removable rubber lining which would keep the contents clean until ready for use. The charge could then be emptied into anything desired, and owing to the flexibility of the container the discharging could be done in a positively dustless manner. This is of great importance when handling poisonous or valuable materials.

In some places all kinds of devices are used to subdue the noise of grinding mills. In others these mills are not permitted on account of the noise. The application of rubber linings would go a long way toward solving the noise problem as well as some others.



Abbé Engineering Co.

Six Jar Laboratory Mill

Dry Grinding Possibilities

Dry grinding has not yet been proved practicable, but there seems to be no reason why it should not be so. If a rubber tire

tread wears longer on dry roads, why should not dry grinding in rubber lined mills be done as well or better than wet grinding when the heat element is not a factor? This question can only be determined by tests that may prove the practicability of the suggestion.

If every laboratory mill in the world was lined with rubber there would not be a notably great increase in rubber consumption as the result. However, the suggestion is well worth the careful consideration of all progressive rubber manufacturers.

Smooth Surfaced Molded Sponge Rubber

In certain molded articles of sponge rubber a smooth surface is desired not only as a suitable finish but also to exclude dust and moisture from the interior and protect it from deterioration by oxidation. Spongy rubber stock expanded against the interior of a hot mold does not produce a smooth surface thick enough to give the desired finish and protection to the object. The proper surfacing of molded sponge rubber articles, however, has been accomplished by a recently patented method.[1]

In accordance with the general features of this invention sponge rubber articles are provided with an outer coating of smooth surfaced rubber by covering the interior surfaces of the curing mold with a coating of rubber compound that will on formation and vulcanization of the sponge rubber body become attached to it and form a smooth surface on the article.

The details of this method are illustrated in connection with a receiver ear piece for aviators' head sets, for which a suitable sponge rubber stock is prepared according to the following formula:

Sponge Rubber Formula

Smoked sheet rubber	37.000
Caucho rubber	28.375
Ammonium carbonate	17.625
English pale vermilion	4.250
Barytes	6.500
Sulphur	4.250
Paraffin	0.500
Mineral rubber	0.500
Accelerator	1.000

The caucho rubber is included in this compound to facilitate the workability of the mixture; the barytes as a filler which in colored articles is used to control the shades. The paraffin and mineral rubber facilitate mixing and also retard oxidation of the finished product. The ammonia carbonate furnishes the gas to produce the cellular structure of the compound.

For making a telephone receiver ear piece such as that shown in section in Figure 1, a circular blank, with central hole, is cut from a sheet of the sponge rubber mixing and placed in the two-part mold illustrated in Figure 2. The inner surfaces of the mold, however, are first treated or painted with a composition like that detailed above but without including ammonium carbonate. Also, there is placed on the lower part of the mold a semi-cured soft solid ring with serrated edges.

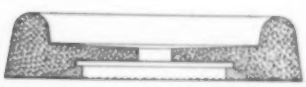


Fig. 1. Sponge Rubber Ear Piece

The mold is then held closed by clamping and placed in a steam jacketed vulcanizer to which compressed air is admitted. The vulcanizing period is continued for 4 hours at 55 pounds air pressure; the steam pressure in the jacket is maintained at 110 pounds per square inch. During the early period of the cure the ammonium carbonate decomposes, and the liberated gases which escape from the mold are vented through small apertures in its bottom section after having caused the cellular structure of the rubber, which renders it spongy. The air pressure in the vulcanizer retards the too rapid escape of gases which are to cause sponging, prevents entire volatilization of the gases and serves also to retard the escape of the plastic compound through the vents in the mold. The air pressure, however, does not prevent the ultimate escape of the ammonium carbonate gases.

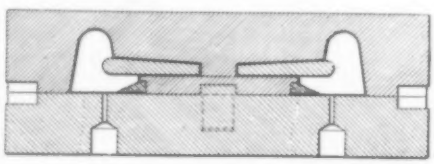


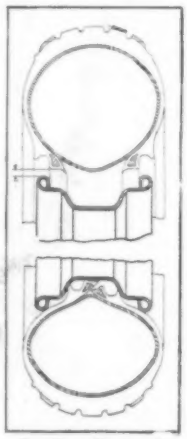
Fig. 2. Mold for Ear Piece

The coating or layer applied to the interior of the mold becomes closely adherent as the sponge rubber blank expands by the generation of gases and upon vulcanization is united to the body to produce the article with a smooth finished surface.

[1] United States patent No. 1,484,731.

Drop Center Rims and Balloon Tires

Balloon tires are now being built by leading manufacturers to fit existing automobile rims and also for rims of smaller diameter, which means a complete changeover. The drop center rim concerns the latter phase of automobile transportation development. This rim is not a new development. It is older than the automobile industry and was first used with the Dunlop-Welch bicycle tire in 1890. It next came into prominence during the war in connection with cushioning airplanes against the uneven surface of landing fields.



Dunlop Drop Center Rim — Note Additional Bead

The drop center rim is made in a single piece with no split or loose flange. After the balloon tire is put on and inflated, the beads slip into their proper place on the base. All that is necessary to remove the tire is to deflate it and press the beads together, the well of the rim permitting sufficient slack to allow one bead to be lifted out from the rim.

Regarding the relation of tire section to rim base width, it is known that the tire with the widest rim and greatest angle of stability gives the least "roll." Although the wide rim base is advocated and proved advantageous with the balloon tire, this does not mean that these rims need to be made heavier than those of present standard practice. It is claimed that the drop center rim is a better structure than present rims and the actual rim weight can be reduced by about seven pounds.

Other points in favor of the drop center rim are that it gives six to eight per cent additional increase of air space for the tube compared to the present standard type rim. It eliminates the use of loose flaps. It also allows the valve stem to pass through at right angles to the sloping side of the rim recess and gives an ideal condition for removing the dust cap and applying the inflating hose. Two base diameters of drop center rims 20 and 21 inches probably will meet all the needs of automobile manufacturers.

To prevent the possibility of damaging the tube or casing by running deflated there is embodied in the tire an additional bead situated low down on the side wall and resting on the rounded flanges of the rim.—The Dunlop Tire & Rubber Corporation, Buffalo, N. Y.

ADDRESS MAIL MATTER CAREFULLY

Due to carelessness in addressing, large quantities of mail are lost each year. The delay or non-delivery of important mail means loss to the sender as well as expense to the postal department. It is said that, because of lack of return address, nearly 20,000,000 pieces of mail are sent annually to the Dead Letter Office.

A. C. S. Rubber Division Meeting

THE sixty-seventh meeting of the American Chemical Society was held at Washington, D. C., April 21-26, 1924. A large and representative attendance of chemists was present from all sections of the country. The programs of the various divisions were as usual of great scientific and practical interest. Numerous excursions afforded the chemists and their guests the opportunity to inspect the scientific and engineering laboratories and museums whose activities are conducted under governmental control. Of notable interest were the laboratories of the Bureau of Standards, the Department of Agriculture, and the Edgewood Arsenal.

The Rubber Division

The program of the Rubber Division was of special interest and its sessions well attended. Distribution in advance of the meeting of the report of the Crude Rubber Committee and abstracts of the papers promoted interest in the discussions by the members of the topics presented.

Abstracts of Papers

A Microscopic Study of Crude Rubber. Brief report of a microscopic study of a sample of first latex crêpe which after milling was stretched into thin sections. The photographs show the intricate network of cells or vesicles and the effect of strains on the size and arrangement of these cells. The pictures have been taken under different light conditions and depths of focus so as to forestall the implication that they showed only surface phenomena. The effect of staining and of the treatment with carbon tetrachloride, considered as a representative rubber "solvent," are also studied.—Irene C. Diner.

Notes on the Microscopy of Lithopone. A summary of observations on the structure of the crystals in a collection of lithopone sample, and showing the wide variety in structure and in size of crystals, and in the impurities found. It is merely an indication of some factors which may explain the variation in the behavior of different samples of lithopone.—Irene C. Diner.

Georgia Clays for Rubber Fillers.—W. M. Weigel.

Reactions of Accelerators During Vulcanization. VII. Aliphatic Amines and Ammonia. Sulphur reacts with the amino hydrogen of aliphatic amines, such as piperidine, diethylamine, benzylamine or n-butylamine, to form thio-hydroxylamines as the first intermediate product. In the presence of metallic oxides these thiohydroxylamines form metallic salts, which in the case of secondary amines are easily isolated. Sulphur easily oxidizes the group =N-SH to n-disulphides, =N-S-S-H=, for secondary amines. These n-disulphides are also prepared by the action of sulphur chloride on the amine and are direct vulcanizing agents for rubber in absence of free sulphur. Primary amines with sulphur at low temperatures give the sulphur analogs of the corresponding aliphatic nitro compounds, $-NS_2$, which are direct vulcanizing agents and may also be prepared by the use of sulphur chloride. These dithionitro derivatives, in their action, are closely related to the vulcanization of rubber by nitro compounds as discovered by Ostromislenski. The action of sulphur chloride on aniline at low temperatures has been described as forming the product $C_6H_5-NS_2$. This sulphur analog of nitro benzene is also a direct vulcanizing agent for rubber in the absence of free sulphur.—C. W. Bedford.

Factors Determining the Reinforcing Value of Fillers in Compound Rubber. The factors determining the reinforcing effect which mineral compounding ingredients impart to vulcanized rubber, in the order of their importance, are: (1) Particle size; (2) Degree of wetting; (3) Particle shape.

Particle size is a paramount consideration. By reducing the particle size of a filler its reinforcing effect in a compound is similarly increased. A filler cannot be dispersed in rubber on the mill unless the rubber wets it. Many fillers are badly agglomerated in rubber and this minimizes the physical properties of a stock. There is no evidence that any differences exist in the strength of the bond between rubber and different fillers except in cases where the fillers are chemically reactive during the cure. So long as the filler is in contact (wet) with the rubber the adhesive force between rubber and filler is determined by the specific surface of the latter. Many fillers impart certain properties to compounded rubber because of their crystalline shape. These properties are manifest even though the filler be completely dispersed and are not obliterated until the particle size is reduced to a state comparable with the finest fillers.—H. A. Endres.

Studies of Vulcanization Accelerators. III. The nickel salts of carbithionic and disubstituted dithiocarbamic acids, although remarkably stable, have practically no accelerating effect either with ZnO or with NiO. Cd and Pb salts are similar in activity to Zn salts when used with ZnO, but Cd salts are somewhat less active when used with CdO, and Pb salts much less active when used with PbO. The effect of certain bases, soaps, and fatty acids on the activity of ultra-accelerators has been examined. In all cases piperidine has a powerful effect. KOH has a much smaller effect. Among sulphur compounds examined which have little or no accelerating effect may be mentioned mercaptans, thioamides, thiuram disulphide, zinc phenyldithiocarbamate. It is concluded that, while all known ultra-accelerators contain a thiol group or are derived from compounds containing such a group, the presence of this group alone is not sufficient to render a substance a powerful accelerator, other necessary conditions being (a) that the carbon atom bearing the thiol group shall be also attached to sulphur, and (b) that the possibility of tautomerism giving rise to a *gem*-dithiol grouping shall be absent. In the case of heterocyclic substances, it is not possible at the moment to define the structure necessary for ultra-accelerating properties, as a number of substances examined which contain a grouping similar to that in mercaptobenzothiazole are lacking such properties.—G. S. Whitby and H. E. Simmons.

The Influence of Organic Accelerators on the Plasticity of Uncured Rubber Stocks. The majority of organic accelerators of vulcanization have a softening action on a rubber stock even in the presence of sulphur, provided the compound is mixed at a sufficiently low temperature. However, this softening action is counteracted by a stiffening effect, commonly called "scorching" or "setting up," when the stock is subjected to a temperature of approximately 80 to 100 degrees C.; this range includes the temperatures ordinarily attained in most of the processing operations such as milling, calendering and tubing. The "scorching" tendency was determined by measuring the decrease in plasticity (increase in the plasticity value K) of a stock during a period of heating at a definite temperature. Results are given showing the "scorching" influence of the commonly used organic accelerators including guanidines, aldehyde amine condensation products, thiocarbanilide and p-nitrosodimethylaniline. The influence of the concentration of sulphur and accelerator is demonstrated. The influence of zinc oxide as well as that of inorganic activators such as lime and calcined magnesia, on certain of these accelerators is also shown.—Stanley Krall.

An Improved Aging Test Involving Oxidation Under Pressure. On the generally accepted theory that the deterioration of rubber

is a result of oxidation, the rate and character of aging is a function of time, temperature, and concentration of oxygen. The Geer life test depends for its accelerated rate chiefly upon the temperature factor, and often gives results at variance with natural aging. These discrepancies are overcome in a new test which consists essentially in greatly increasing the oxygen concentration. By submitting rubber to oxygen at high pressure (e.g., 300 pounds per square inch) at 50 to 70 degrees for some hours, deterioration practically identical with several years of natural aging occurs.—J. M. Bierer and C. C. Davis.

Laboratory Tests of Air Bag Compounds. Sheets of various air bag compounds were subjected to the action of air under 200 pounds pressure at curing temperatures for varying lengths of time. They were also subjected to overcure by being buried in powdered sulphur at different temperatures for varying periods. The sheets were compared by their resistance to cracking when flexed over curvatures of very small radii. When a bag stock starts cracking, deterioration proceeds much more rapidly than theretofore. Resistance to cracking was therefore taken as a measure of service of the stock rather than the tensile strength.—A. H. Smith and H. K. Eckert.

Rubber Compounding for Water Dispersions. It is pointed out that in the manufacture of rubber articles by the use of rubber compounds dispersed in water it is no longer necessary to employ large amounts of soft, low grade, tacky rubbers, oils, etc., to soften the compound to a consistency required for calendering or tubing. A new system of compounding is therefore needed in which it is feasible to use all high grade rubber and in which water-soluble substances may be incorporated if so desired.—John B. Tuttle.

The Theory of the Aqueous Dispersion of Rubber, and Its Effect on Our Present Theory of Vulcanization. According to the theory of aqueous dispersions, rubber exists both in the vulcanized and unvulcanized state, as dispersed rubber particles, with the non-rubber constituents comprising the continuous phase of the mass. By rehydration, the dispersion as existing in latex can be reformed by the introduction of a lubricating agent. The various phenomena of calender grain, vulcanization, permanent set, etc., are discussed from this angle.—John B. Tuttle.

An Effective Inexpensive Safety Device for Laboratory Mills and Calenders. A very simple, inexpensive and absolutely reliable safety device for stopping laboratory mills and calenders in an emergency is described.—C. W. Christensen.

Method of Determining Consistency of Benzene Solutions of Rubber. Tests at the Bureau of Standards have shown that, at least in some cases, benzene solutions of rubber are plastic. Consequently it is not possible by the measurement of so-called relative viscosity, as proposed by the Dutch East Indies rubber experiment stations, to identify the consistency of these solutions. It is believed that some instruments should be adopted in which successive trials may be made at different rates of shear, in order that a distinction may be made between viscous and plastic materials.—Winslow H. Herschel.

Cloudiness of Rubber Cements. While cements prepared with benzene are transparent, most other solvents produce cements of varying degrees of cloudiness. This cloudiness is due to the protein material in the rubber and can be reduced by controlling the refractive index of the cement. While either gasoline or CS_2 produce cloudy cements, mixtures of the two produce a clear cement when the refractive index is 1.51. The refractive index of clear cements varies somewhat when rubber of different botanical origin is used.—Ira Williams.

The Performance of American Peptized Kaolin in Rubber Compounds. The preparation of peptized kaolins is described. Its reinforcing action in rubber compounds and its comparison with zinc oxide and carbon black in imparting various physical properties to vulcanized rubber is given.—E. M. Slocum.

Theories of Vulcanization. The attempt will be made to show that the phenomena of vulcanization can be satisfactorily explained by consideration of the interfacial energy in the rubber system. This applies not only to rubber alone but also to mixtures containing organic and inorganic accelerators and some of the common compounding ingredients.—J. Kelley.

Committee Reports

Two committee reports were submitted and discussed, one on physical testing methods and the other on crude rubber testing. The latter report discussed the following problems: (1) An adequate Sampling Method; (2) A procedure to determine Resistance to Mastication; (3) The Plasticity of Crude Rubber; (4) The determination of Rate of Vulcanization; (5) The Evaluation of Quality; (6) Viscosity of Rubber Solutions; (7) The Standardization of Plantation Grades.

Details will be published in the June issue covering the discussions of papers and committee reports.

STATEMENT OF THE INDIA RUBBER WORLD

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of THE INDIA RUBBER WORLD, published monthly at New York, N. Y., for April 1, 1924.

State of New York, } ss.:
County of New York }

Before me, a notary public in and for the State and county aforesaid, personally appeared E. M. Hoag, who having been duly sworn according to law, deposes and says that she is the business manager of THE INDIA RUBBER WORLD, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, The India Rubber Publishing Co., 25 West Forty-fifth Street, New York City.

Editor, Henry C. Pearson, 25 West Forty-fifth Street, New York City.

Managing Editor, Henry C. Pearson, 25 West Forty-fifth Street, New York City.

Business Manager, E. M. Hoag, 25 West Forty-fifth Street, New York City.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

The India Rubber Publishing Co., 25 West Forty-fifth Street, New York City.

Henry C. Pearson, 25 West Forty-fifth Street, New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by her.

E. M. Hoag, Business Manager.

Sworn to and subscribed before me this 25th day of March, 1924.

[SEAL] HARRY HOAG, Notary Public.

N. Y. Co. Clerk's No. 537
N. Y. Co. Register 5064

(My commission expires March 30, 1925.)

THE UNITED STATES HELD IN 1923 A LEADING POSITION AS exporter of mechanical rubber goods, during that year outdistancing Germany, which had heretofore been the strongest competitor in the rubber hose trade. In 1922 Germany exported 4,057,566 pounds of such goods, as compared with the United States, with 3,381,210 pounds. In 1923, however, the position was reversed, German exports of this commodity falling to 3,667,572 pounds, while the United States exports increased to 4,455,502 pounds.

GREAT BRITAIN IS THE STRONGEST COMPETITOR OF THE UNITED States in the belting export trade, her exports in 1922 of "belting other than leather, woven hair and cotton" amounting to 2,372,496 pounds, rising in 1923 to 2,650,256 pounds. American exports, however, of rubber belting increased in the corresponding two years from 2,590,057 pounds in 1922 to 3,548,468 pounds in 1923.

What the Rubber Chemists Are Doing

Influence of Certain Compounding Ingredients in Hard Rubber[1]

By W. E. Glancy[2]

THE results below were obtained under test conditions as nearly identical as possible. A standardized method of handling all mixings was followed, and the tests were carried out at 21 degrees C. on a horizontal Scott tester, the clamps separating at the rate of 0.5 cm. per minute, as recommended by the Hard Rubber Division of the War Service Committee in its report of August, 1918.

A three-cavity mold was used and the only cutting necessary was that of the thin overflow from the test piece. Results recorded are the average of at least three tests. They do not represent absolute values, but are comparative only, showing general tendencies.

Results

Proportions of rubber and sulphur were chosen within limits which might be considered as the hard rubber field, as shown in Table I. Attention is called to the very rapid increase in breaking strength between cures of 35 minutes and 45 minutes for all the mixings, and to the high breaking strengths which are attained. It is also noted that there is an actual decrease in strength when the amount of sulphur is increased from 66.7 per cent to 100 per cent by weight on the rubber. As the length of cure is increased, the ultimate elongation decreases much as the breaking strength increases.

TABLE I

Rubber—Sulphur

Time of cure		35 Min.	40 Min.	45 Min.	60 Min.	90 Min.
Compound	Per Cent Sulphur to Rubber	Tensile Strength—Kg. Per Sq. Cm.				
A	100.0	60.4	302.7	424.9	538.3	564.9
B	66.7	209.3	442.7	501.3	603.1	621.2
C	42.8	29.3	121.8	237.8	519.0	580.4
D	33.3	37.5	69.4	130.0	417.2	516.1
		Ultimate Elongation—Per Cent				
A	100.0	65.9	4.1	3.7	3.0	5.5
B	66.7	98.0	4.0	3.0	5.0	5.0
C	42.8	58.0	77.0	31.0	6.0	6.0
D	33.3	88.8	77.1	74.1	6.5	5.3

Table II shows the diluent effect of mineral rubber and resin with quantities up to 13 per cent by volume when added to a 700:300 rubber-sulphur mixture.

TABLE II

Base mixing: 700 rubber, 300 sulphur

	Tensile Strength Kg./Sq. Cm.		Ultimate Elongation Per cent	
	40 Min.	45 Min.	40 Min.	45 Min.
Volumes Mineral Rubber to 100 Volumes Rubber	Mineral Rubber–Sulphur–Rubber			
0.00	121.8	237.8	77.0	31.0
2.60	161.4	308.4	93.0	12.0
9.50	229.5	405.2	98.0	9.0
9.80	175.5	338.5	35.0	11.0
13.00	187.1	340.3	93.0	12.0
Volumes Resin to 100 Volumes Rubber	Resin–Sulphur–Rubber			
0.00	121.8	237.8	77.0	31.0
2.39	247.8	419.6	34.2	5.7
4.78	257.1	460.6	90.0	4.8
7.17	334.4	392.7	18.0	5.1
11.93	339.2	435.9	10.7	3.1

Table III shows the influence of magnesium oxide and lime in a base mixing of 700 parts of rubber and 300 parts of sulphur by weight. The quantities used of these two inorganic accelerators are as large as is common in soft rubber goods, and the figures show a decided hardening effect with the introduction of these materials and answer the question as to whether hard rubber compounds are influenced by inorganic accelerators.

TABLE III

Base mixing: 700 rubber, 300 sulphur

	Tensile Strength Kg./Sq. Cm.		Ultimate Elongation Per cent	
	40 Min.	45 Min.	40 Min.	45 Min.
Volumes MgO to 100 Volumes Rubber	Magnesium Oxide–Sulphur–Rubber			
0.00	121.8	237.8	77.0	31.0
0.42	281.0	368.0	16.0	3.0
0.83	310.6	381.0	30.0	6.0
2.08	338.7	459.0	17.0	3.0
3.11	415.9	485.2	7.0	4.0
Volumes Lime to 100 Volumes Rubber	Lime–Sulphur–Rubber			
0.00	121.8	237.7	77.0	31.0
0.58	288.2	386.1	29.0	9.0
1.16	350.0	430.1	8.0	7.0
2.91	468.4	491.7	7.0	5.0
4.37	485.3	490.2	6.0	4.9

Table IV shows the influence of tire reclaim. A small quantity of reclaim acts as a hardening agent, as shown by the increase in breaking strength and decrease in elongation. Increasing the quantity, however, causes a softening of the specimens cured under like conditions, probably due to the rubber in the reclaim which does not have sufficient sulphur available to harden it.

TABLE IV

Tire Reclaim—Sulphur-Rubber

Base mixing: 700 rubber, 300 sulphur

	Tensile Strength Kg./Sq. Cm.		Ultimate Elongation Per cent	
	40 Min.	45 Min.	40 Min.	45 Min.
Volumes Reclaim to 100 Volumes Rubber				
0.0	121.8	237.8	77.0	31.0
5.11	372.8	480.4	7.3	4.5
10.22	335.2	428.2	16.9	7.5
20.44	329.4	404.9	35.4	8.8
40.88	221.8	289.8	68.9	57.2

Conclusions

1. There is a critical point in the process of vulcanization of hard rubber, and if the curing is interrupted previous to this point a flexible, leathery material is produced. If the curing is continued beyond this point, a sharp increase in breaking strength and corresponding reduction in ultimate elongation occur together with the hardening of the rubber—a specific case showing an increase from 500 pounds per square inch to 5,500 pounds per square inch in the 10 minutes near the critical point.

2. As the proportion of sulphur is increased, a point is reached where further increase in sulphur no longer causes an increase in breaking strength, but an actual weakening due to dilution occurs.

3. Under the vulcanizing conditions described, materials of the mineral rubber type can be used with advantage up to about 7.5 volumes, when a weakening of the compound occurs.

4. Lime and magnesia, which possess accelerating properties in soft-cured rubber, also decrease the time required to harden the compound and increase the breaking strength when used in small quantities.

5. Resin may be used to actual advantage up to about 5 volumes.

[1]Presented before the Division of Rubber Chemistry, at the 64th meeting of the American Chemical Society, Pittsburgh, Pennsylvania, September 4-8, 1922.

[2]Hood Rubber Co., Watertown, Massachusetts.

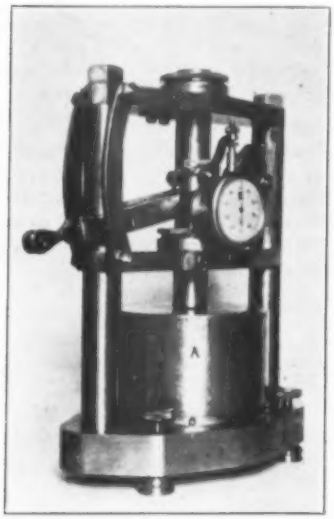
6. Tire reclaim of the grade described, in quantities up to 6 volumes, causes a large increase in breaking strength and decrease in ultimate elongation, and in larger quantities reduces the breaking strength and increases the ultimate elongation.

Plasticity of Rubber and Its Measurement[1]

By Ira Williams[2]

In designing an apparatus for the measurement of plasticity, the first requirement is to insure true plastic flow. In addition, the test must be carried out under known temperature conditions with a small amount of material. These conditions practically eliminate any method of flow through tubes or of penetrating points, since the internal resistance of the rubber is so great that slipping will take place between the rubber and the tube or point.

The essentials of the apparatus as designed are shown in the illustration. Plate *A* is free to be raised and lowered, and is supported in such a manner that it is always exactly parallel to plate *B*. The total weight on the rubber between the plates is 5000 grams. The gage *E* serves to show the thickness of the disk of rubber at all times. With this apparatus a definite motion is always imparted to the same volume of rubber. There is no slipping between the plates and the rubber.



Plasticity Press

The test is conducted as follows:

The press is placed in an oven and allowed to assume the desired temperature. The temperature generally used for crude rubber is 100 degrees C. Two cubic centimeters of the rubber or stock are obtained in the form of a round pellet or short cylinder. This is done by punching out a pellet with a 15 or 16-mm. cork borer and trimming the edges of the pellet with a pair of scissors until the required weight is obtained. The pellet is then laid between two sheets of paper (a folded paper is most convenient) and placed in the press. Gage readings are taken at known time intervals, generally 3, 5, 10, etc., minutes, in order that the thickness-time curve may be plotted. The thickness of the paper subtracted from the gage reading gives the thickness of the rubber.

Preparation of Laboratory Sample

Most samples of rubber require preparation before a plasticity determination can be made. Except in the case of slab or similar types of rubber, it is generally impossible to cut uniform pellets with a volume of 2 cc. If the rubber is in the form of thin uniform sheets, it is possible by removing the surface to build up the sheet to a thickness that will permit a suitable pellet to be made. This cannot be done with thin crêpes, and it will be found, in general, that a period of milling is necessary.

The plasticizing action of a mill depends upon the resistance offered by the rubber. Unless resistance is offered by the rubber no work can be done upon it. This means that the power consumption is much larger for a stiff rubber, and that the actual reduction in the value of *K*, the plasticity number, for the initial period of milling must be much greater than in the case of a soft rubber. Stiff rubber not only generates the greatest amount of heat, but its plasticity is most affected by changes in temperature. This means that the stiff rubber softens itself temporarily on the mill, due to the heat generated by milling. There is, then, an equilibrium which can be reached for each particular case when the rubber will continue to work on the mill without being further plasticized. If the rubber becomes softer, due to rise in temperature, the internal resistance will decrease until the energy that is expended on the rubber is not great enough to cause further breaking down. For this reason a stiff rubber may appear to break down as soon as a soft rubber, although this does not mean that the total energy expended has been the same or that the same plasticity has been reached. If the stiff rubber could be cooled during milling to a temperature equal to that of the soft rubber, the breaking down of the stiff rubber would be very much greater.

It can be seen that if two samples of rubber having different original values for *K* were milled under the same temperature conditions, the tendency would be to bring the values of *K* nearer together. If, however, the rubber is permitted to assume its own equilibrium with the heat generated, the tendency is to preserve the difference in original plasticity and to reduce to an equal power consumption. In any case where it is necessary to mill the sample of rubber before suitable pellets can be made, the value of *K* is decreased, although if the heat generated is allowed to remain in the rubber the relation between the *K* values for two samples of rubber remains practically the same as in the unmilled rubber.

The following procedure has been used in preparing a sample on a 12 by 6-inch laboratory mill:

The sample is milled hot and for a short time in order to preserve the original plasticity as much as possible. Hot water is turned through the rolls with the mill running until the temperature of the rolls is just above 60 degrees C.[3]

The water is then turned off, the temperature allowed to fall to 60 degrees C., and a 500-gram sample placed on the mill while the rolls are approximately 2 mm. apart. This leaves only a small bank of rubber between the rolls. The rubber is allowed to remain on the mill for 4 minutes, after which it is taken off and folded to the required thickness. Plasticity measurements may be run as soon as the sample is cool.

The foregoing procedure will, of course, give different results for the same rubber if conducted on different mills. A temperature of 60 degrees C. and 500 grams of rubber are convenient for a 30-cm. (12-inch) mill. Larger mills would require larger samples. The surface speed and the ratio between the speed of the front and back roll of the mill also influence the power consumption and the plasticizing action. Any mill may be used to obtain comparisons between two samples of rubber.

Plasticity of Different Types of Rubber

The average stiffness of the different types of rubber increases in the order: low-grade, smoked sheet, crêpe rubber, and slab rubber or evaporated latex. The values within a single type of rubber vary enough for the plasticity numbers to overlap,

[1] Presented before the Division of Rubber Chemistry at the 66th Meeting of the American Chemical Society, Milwaukee, Wis., September 10 to 14, 1923.

[2] Firestone Tire & Rubber Co., Akron, Ohio.

[3] For measuring roll temperature a fine copper-constantan thermocouple is soldered to the center of a piece of thin copper sheet which is approximately 13 mm. (0.5 inch) square and curved to fit the mill roll. The wires are brought through the center of a piece of thin felt about 38 mm. (1.5 inches) square and the copper fastened to the felt. Five to 8 cm. (2 or 3 inches) of wire are coiled against the back of the felt and covered with several additional layers of felt. This is then fastened to a cork or other suitable handle. Temperature is measured with the mill running. Although this method is open to criticisms, the results are but slightly affected by differences in contact pressure with the roll, and equilibrium is quickly reached. Whether the temperature recorded is exactly correct or not the temperature conditions can be duplicated.

and it is common, for instance, to find samples of crêpe rubber that are much more plastic than some samples of smoked sheet.

Plasticity of Compounded Stocks

It is found, in general, that plasticity determinations may be made with compounded stocks as well as with pure rubber. Exceptions are caused by samples that are capable of beginning to cure in a few minutes at the temperature of the determination. In this case the curve obtained with the press flattens and will finally become parallel to the X axis when all flow ceases. In dealing with this type of stock it is necessary to take the first reading as soon as possible. In this way a value for K is obtained before the curing action has proceeded far enough to affect the determination materially.

The initial curing action of accelerators or the tendency of a stock to "burn" while in process may be determined by means of the effect on the plasticity curve. Change in plasticity can be made the basis for a comparison of accelerators providing the amount of accelerator used is not great enough to affect the three-minute reading and providing the second reading is not taken too near the flat portion of the curve.

Chemical Patents

The United States

VULCANIZATION OF RUBBER. Rubber is vulcanized without the aid of heat by the interaction of sulphur dioxide and hydrogen sulphide in the mass.—Stanley J. Peachey, Davenport, Stockport, England. United States patent No. 1,487,880.

VULCANIZATION ACCELERATOR. Manufacturing a vulcanizing accelerator comprising subjecting the reaction product of aniline and carbon disulphide to destructive and fractional distillation.—Norman A. Shepard and Justus H. Doering, assignors to The Firestone Tire & Rubber Co., all of Akron, Ohio. United States patent No. 1,490,073.

The United Kingdom

VULCANIZING RUBBER AT LOW TEMPERATURE. Vulcanized rubber slabs are formed by building up calendered sheets which contain alternately sulphur and an accelerator, which under 150 degrees F. migrate and effect vulcanization through the mass. The individual sheets are not vulcanizable at the temperature employed. Suitable accelerators are the product of dimethylamine and carbon disulphide, and the piperidine salt of carbon disulphide. Example, one batch comprises smoked sheet, zinc oxide and sulphur, and the other smoked sheet, zinc oxide and the accelerator named. The thickness of the sheets may be varied in accordance with the migratory speed of the vulcanizing ingredients.—J. E. L. Barnes, 34 Castle street, Liverpool, England. (Miller Rubber Co., Akron, Ohio.) British patent No. 209,772.

WATERPROOFING LEATHER. Leather is waterproofed and strengthened before or after tanning by impregnation or spraying with ammonia preserved latex. Sulphur, glue, filling materials and coloring agents may also be added.—R. Russell, Lands End House, Rhodes near Manchester, and H. Broomfield, 23 Davenport Road, Hazel Grove, Southport, Cheshire. British patent No. 209,811.

AQUEOUS DISPERSION OF RUBBER. Water dispersions of rubber with various compounding ingredients may be used as water paints, for fabric coating, etc.—Plausson's Limited, 17 Waterloo Place, Pall Mall, London. British patent No. 210,495.

LATEX TREATED PAPER. Paper pulp and unwoven fibrous materials are impregnated with vulcanized latex and the vulcanized rubber is deposited on the fiber by the addition of a coagulant.—P. Schidrowitz, 27 Chancery Lane, London. British patent No. 210,526.

FIBROUS PLASTIC COMPOSITIONS. Fibrous materials of various origins with or without filling materials are pulped and treated with latex. The rubber is coagulated on the beaten fibers; sulphur and accelerators are added and the pulp is then drained, molded and vulcanized.—F. Kaye and Kaye's Rubber Latex Process, Ltd., Great Winchester street, London Wall, London. British patent No. 210,193.

New Zealand

RUBBER AND RUBBER COMPOUND MANUFACTURE. Comprises vulcanizing a rubber mix containing a zinc oxide product, characterized by one or more specified properties, namely, an average particle size not exceeding about 0.15 microns; capacity of substantially accelerating the cure of compounded rubber; capacity of imparting to compounded rubber an increased resistance to abrasion of about 50 to 100 per cent or more as compared with the standard rubber reinforcing zinc oxides.—The New Jersey Zinc Co., 160 Front street, Manhattan, New York, N. Y., assignees of James A. Singmaster, Frank G. Breyer, and Earl C. Gaskill, all of Palmerton, Pennsylvania. New Zealand patent No. 50,284.

AQUEOUS EMULSIONS OF RUBBER. Dispersions of crude rubber by either of two modes by which a product of desired consistency is obtained consisting of water as the continuous phase and the rubber particles or globules as the disperse phase. In practicing the process a substance of a soapy or lubricating nature is employed in promoting the dispersion such as certain soaps or saponins, soap-bark extract, certain water soluble oils or any suitable lubricant which will promote slipping of the rubber globules relative to each other without adhesion.—William B. Pratt, 28 Pine street, Wellesley Hills, Wellesley, Massachusetts. New Zealand patent No. 51,370.

Germany

Patents Issued with Dates of Issue

393,292 (October 8, 1922). Method of vulcanizing natural and synthetic rubber. Dr. H. Rimpel and Asbest-und-Gummiwerke Alfred Calmon A.-G., Hamburg.

Austria

Published December 15, 1923

A.6062-20 Method of making condensation products. Dr. F. Pollak, Vienna.

France

Patents Issued With Dates of Issue

564,816 (March 23, 1923). Improved method of vulcanizing rubber and repairing pneumatic tires. P. L. Menjon.

565,158 (April 16, 1923). Improvements in the manufacture of diphenylguanidine. The Naugatuck Chemical Co.

566,700 (May 25, 1923). Process of extracting rubber from latex. J. Oltmans.

BLANC FIXE

Blanc fixe is a precipitated barium sulphate and therefore quite different as to purity and particle size from the highest quality ground natural barytes. When thoroughly washed and properly dried blanc fixe is extremely fluffy and soft. It is used as an adjunct with zinc oxide and, it is claimed, will increase the resiliency of rubber. It is chemically inert and is considerably lower in gravity than zinc and other oxides.

CATHETER VARNISH

A special flexible spirit varnish, known as catheter varnish, is designed for application to catheters and various other soft rubber surgical goods, tubing, or any rubber article that in service requires protection from oil. This varnish is also much used to render dull rubber glossy and on the insulation of the ignition cables of automobiles as protection against the deteriorating effects of oil.

ZINC YELLOW FOR RUBBER

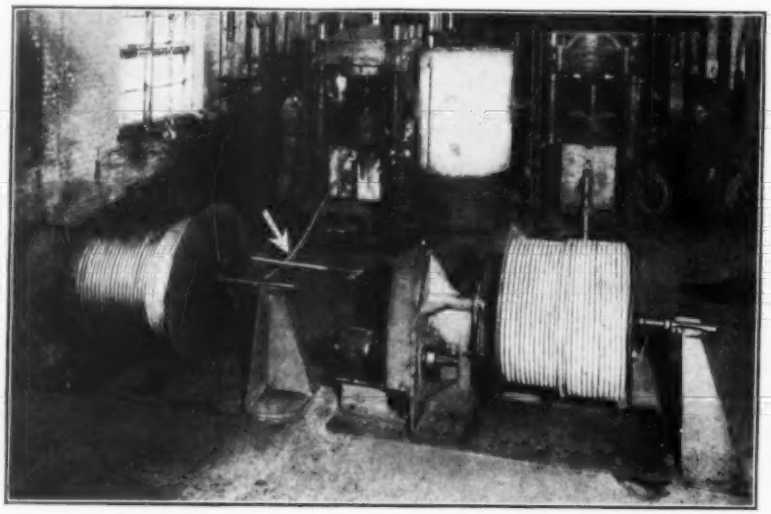
An inorganic pigment of bright yellow color designed for coloring rubber is composed largely of zinc chromate. It is not affected by either hot or cold vulcanization. It is suitable for druggists' sundries, labels and various novelty rubber articles.

New Machines and Appliances

Automatic Wind-Up Reel

Two motor driven automatic reels are shown in the illustration arranged to wind up lead encased garden hose as delivered from a pair of lead presses. The mechanism of the reels is entirely housed and mounted on rigid bed-plate.

The removable reel is mounted in a stand on an axle one end of which is coupled to the shaft of the driving mechanism. A yoke with two spring contacts bearing on one head of the reel serves as a braking device.



Motor Driven Automatic Reel—Arrow Indicates Trip Lever

Between each reel and its lead press in the background is an electrically connected trip lever under which the lead covered hose passes to the reel. The function of the trip is to automatically regulate the speed of the wind-up to that of the press output. The trip raises and lowers according to the tension on the hose as it approaches the reel. Thus, the action of the reel wind-up is entirely automatic.

One operator only is required to handle a press and reel. Located between the presses in the picture is shown the lead melting furnace which supplies the presses.—H. Munroe Smith, P. O. Box 198, Passaic, New Jersey.

Rotary Bias Fabric Cutting Machine

No branch of the rubber industry offers a greater field than tire production for cost reduction by elimination of waste. For example, it is claimed that on the tire output of the United States for 1923 the waste of frictioned tire fabric amounted to $7,000,000. In large part this sum represents waste due to trimming bias plies cut too wide or out of parallel. The problem of saving in this item of tire manufacturing loss is a matter of better bias cutting. The latest development in this field is the bias cutter here shown that was recently demonstrated with success in one of the largest tire factories in the United States. A brief description follows.

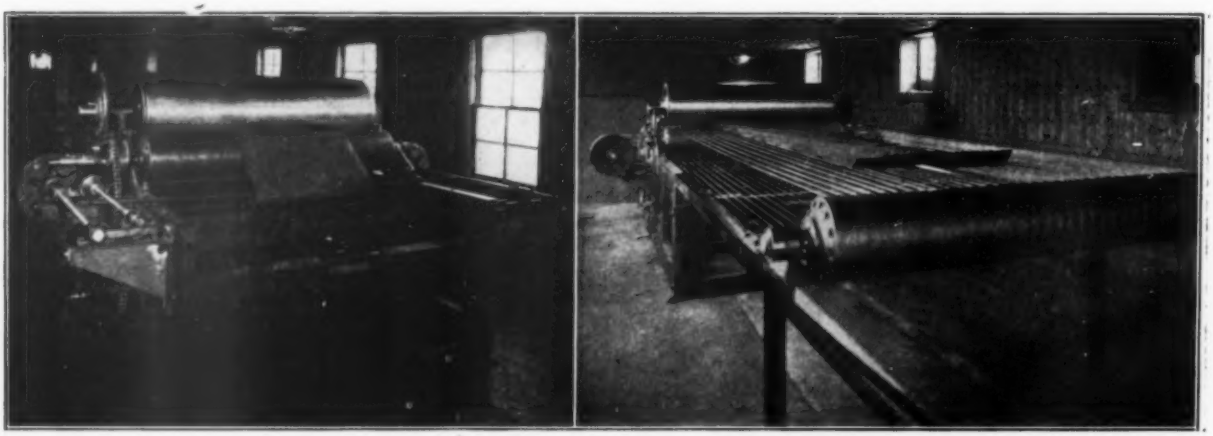
This machine was designed to accomplish the following objects: (1) reduction of friction waste; (2) securing uniform distribution of cords in the plies; (3) saving labor; (4) cutting each ply to individual and accurate size; (5) cutting several plies of different selected scheduled widths; (6) printing an identification mark on each ply simultaneously with the cutting operation.

The machine is of rotary type and the mechanism comprises a large pipe roll or drum positively driven at definite surface speed which is the same as that of an endless link chain traveling across the machine directly under the drum and axially to it.

Fixed to this chain at intervals is a series of bronze blocks which carry either a freely turning circular cutter or a rotary bronze marking wheel. The bearing of these cutters and markers can be adjusted against the under side of the drum or anvil roll, the one to cut and the other to mark the fabric as it passes.

The surface speed of the drum and that of the endless chain cutter are equal and their lines of travel are at right angles to each other; therefore the cutting line is a resultant between them, giving a bias of 45 degrees which is the one generally employed. This angle can be altered to any other desired by adjusting the relative speeds of drum and chain.

Ply widths are determined by the interval between the cutters

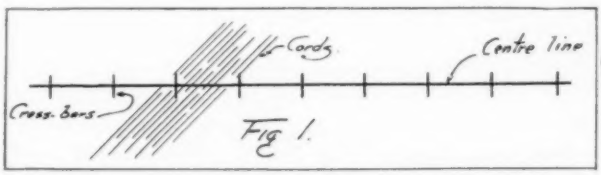


Front and Rear Views of Messer Rotary Bias Cutter

on the chain, which may be adjusted to the widths specified.

Ink for the marker wheels is supplied from an ink fount by alternate steel and glue composition rolls. The marker following each cutter produces an impression of center line and cross marks on each cut strip.

The tire builder uses the center line in locating the plies and the cross marks as a vernier in connection with a corresponding printed flexible rule with which he is furnished. When the ply stretches the number of bars between two adjoining registering



Tire Builder's Center Line and Stretch Guide Cross-Bars on Bias Ply

bars on strip and rule indicates the stretch on the principle of the vernier.

As the fabric passes through the machine it is compressed against the upper roll by two small rollers which hold it against the drum and prevent side movement as the cutters advance across the web. As the sticky plies emerge from the cutting line they are detached from the drum by fine jets of air forced through a blade extending across the machine and adjusted to deliver the air between the drum and fabric. The bias strips fall on a conveyor made up of small steel cable wound endless between two horizontal rollers.

The speed with which this machine may be operated is practically unlimited. It depends only on the facilities for the removal of the cut product from the conveyor which delivers the plies from the machine.—V. V. Messer Manufacturing Co., Inc., 401 Winthrop Avenue, Long Island City, N. Y.

Flexible Shaft Tire Buffer

Strand Tire Buffer

The buffer here pictured will appeal to rubber manufacturers and tire vulcanizers whose work requires buffing in order to secure good cemented joints.

The machine comprises a motor driven flexible shaft to which may be attached a wire brush, grinding wheel, or taper rasp, as the nature of the work to be done may require. The motor is of ¼-horse power, mounted upon a swivel base and adjustable column which is made extra heavy with large diameter base to give stability.—N. A. Strand & Co., 5001-09 North Lincoln street, Chicago, Illinois.

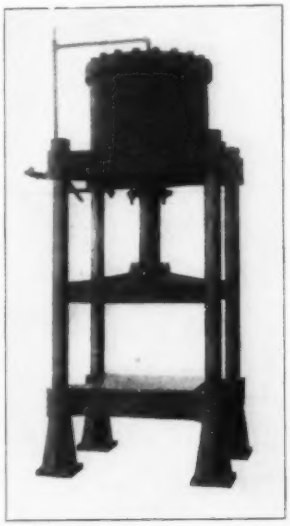
Improved Hack Saw Blade

A new type of hack saw blade is made of high speed tungsten steel and has a patent set which enables it to be sharpened many times by a grinding machine of novel design.

This saw blade is operated in a special machine at 170 r.p.m. and definite pressure which permits obtaining the full benefit from the high speed steel blades.—Edward G. Herbert, Ltd., England.

Hydro-Pneumatic Press

A hydro-pneumatic press is here pictured that possesses features of adaptability to various manufacturing industries.



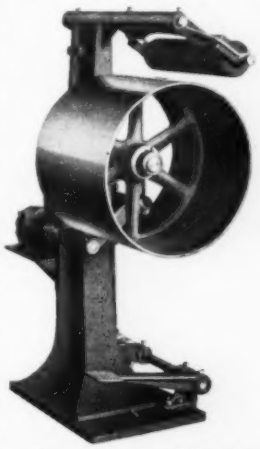
Barr Hydro-Pneumatic Press

In the rubber industry it is being employed in the manufacture of rubber storage battery boxes. On account of its possible rapid action the press may be applied to other rubber purposes, such as cutting out in quantity flat forms from slab stock for molding, also gaskets, rings and other forms from cured sheet packing.

This press is also furnished with steam curing platens for use with molds as a vulcanizing press. Its construction is at once simple and rugged, making it a practical piece of mechanism for many factory purposes where rapid applications of heavy pressures are called for.—H. Edsil Barr, Erie, Pennsylvania.

Cord Tire Band Building Machine

The importance of cutting tire building costs lends timely interest to the improved motor driven band building machine here pictured, which is said to have withstood the test of production by more than doubling the output per hour of bands per operator.



The Banner Band Builder

The main frame and drum of the machine are rugged castings. The drum is accurately turned and bored and mounted on roller bearings. The speed of the drum is 18 r.p.m. For the regular size tires the drum and roller of the machine are 17½ inches wide, and for balloon tires they are 26 inches wide. Only one gear reduction is required, as the second reduction of the motor speed is made through a friction drive on the drum, which also serves as a clutch and permits a variation in speed when applying cord fabric.

The pressure roll is covered with sponge rubber to absorb variations in the stock and to prevent the fabric from crowding. It is controlled through a slip link allowing it to be lowered on the drum by pressure on the foot pedal, but no pressure can be applied after the roll is in contact with the drum. The roll revolves under its own weight, which is sufficient to unite the plies without stretching the fabric.

In operation the first ply is placed around the drum and its ends joined and rolled. One end of the second ply is started upon the first ply and one revolution of the drum suffices for each ply as added. Timing these operations with the facilities afforded by the machine allows band building at double the speed of hand operated drums.—The Banner Machine Co., Columbiana, Ohio.

"PNEUMATIC TIRES," BY HENRY C. PEARSON. AN ENCYCLOPEDIA of tire manufacture, repair, rebuilding, machinery and processes.

Balloon Tire Pressure Gage

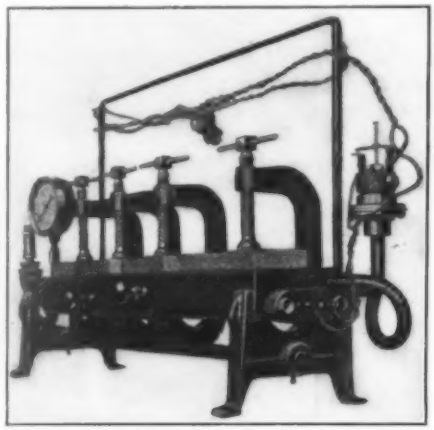
A new tire pressure gage designed especially for balloon tires is here pictured. The construction of this gage is based on the Bourdon spring principle and is made of non-corrosive materials throughout. Accuracy is the important feature which renders this instrument adapted for use with the low pressure tires.

It is made in a single standard model so designed that its application to the valve stem is convenient on whatever type of wheel the tire may be mounted. When the gage is placed on the tire valve the pointer instantly indicates on the dial the air pressure in the tire. When the reset pin is pushed the needle snaps back again to zero.—United States Gauge Co., 44 Beaver street, New York, N. Y.

United States Tire Gage

Electric Steam Tube Vulcanizer

The automatic electric steam tube plate vulcanizer here pictured possesses a number of exclusive features that will be appreciated by the vulcanizer. These features include an extra large curing surface under most reliable electrical control. The electric heating element is immersed directly in the water and if kept so will last indefinitely. The screw clamps are exceptionally sturdy and the same may be said of the steam gage, which has a face sufficiently large to be easily read at a distance.



American Electric Tube Plate

A quick acting brass pop-valve guards against damages by excess of pressure, while two leak-proof try-cocks are located at high and low water level to insure against running dry and burning out the heating elements and the work on the curing plate.—American Vulcanizer & Supply Co., 825 West Pico street, Los Angeles, California.

Rubber-Lined Seal Ring for Centrifugal Pumps

One of the special features of the Moore centrifugal pump is the rubber impeller sealing ring which is used to eliminate leakage between the suction and discharge members. The rings fit the impeller closely, allowing a minimum of water to pass in the form of a film and are practically frictionless and indestructible. In special cases metal-graphite or labyrinth rings may be used, which are interchangeable.—Moore Steam Turbine Corporation, Wellsville, New York.

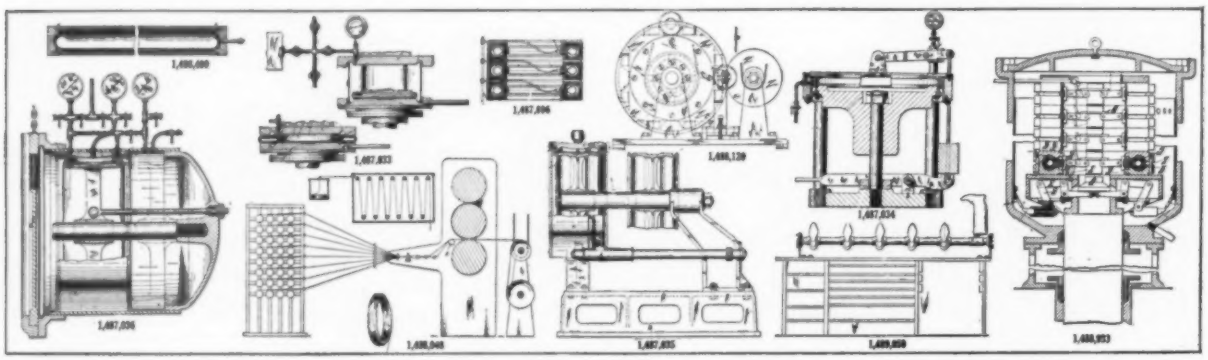
Machinery Patents

Pneumatic Tire Cover Making Machine. An endless flat tire band is positioned between two horizontal plates of a hydraulic press. Between these plates an expanding retaining ring is placed to receive the shaped tire. Inflation pressure being applied as the plates are brought together, the band is distended circumferentially and shaped by the expanding ring. The retaining ring enables vulcanization of the band without an air bag.—Thomas Sloper, Devizes, England, United States patent No. 1,487,033.

Machine for Expanding Flat Band Tires. Tire covers shaped by this apparatus are in the form of flat endless bands. When the band is placed between the plates in the upper part of the expanding machine it forms a closed chamber. When the plates are moved together the air between them is compressed and the central portion of the tire band is forced outwards, thus shaping the band.—Thomas Sloper, Devizes, England, United States patent No. 1,487,034.

Removing Flat Tire Bands from Circular Building Forms. The form carrying a flat tire band is mounted on the shaft of a pedestal within a two part shell, the edges of which form an air tight joint with the edges of the band. A cavity is thus formed between the band and the surrounding shell into which the band can be inflated lifting it free from the building form. The latter is then removed from the machine and a circular curing form is slid into its place under the stretched band held in the cavity. When the difference of pressure at the two sides of the band is removed the band is released and contracts on the curing form placed to receive it.—Thomas Sloper, Devizes, England, United States patent No. 1,487,035.

Removal of Flat Band Tire from Its Support. A cylindrical compression chamber is so arranged relatively to the tire band and its support that the joints along the two edges of the band between the band and the support are exposed to the interior of the chamber and a circumferentially extending cavity surrounding the tire band. In operation the tire band is inflated



outwardly away from its support into the circumferential cavity. The support is then withdrawn and the pressure released from the band in the cavity allowing it to relax ready for removal from the apparatus.—Thomas Sloper, Devizes, England, United States patent No. 1,487,036.

VULCANIZER CONNECTION. This coupling is shown in connection with the expansible bag or core and the flexible supply tubes for the pressure mechanism used in vulcanizing pneumatic tires. Each flexible tube has a stem which serves as the connecting unit forming an air tight joint through which the pressure medium is transferred from one pipe to the other. The coupling is locked together by a sleeve or bayonet joint.—Clifford D. Smith, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio. United States patent No. 1,487,696.

MANUFACTURE OF WEFTLESS FABRIC. Rubberized weftless fabric is produced by passing cords in sheet formation from a creel through a comb-like device in conjunction with guiding rolls through a tank of rubber latex. The dipped cords are then dried and wound in roll form. The fabric thus produced subsequently receives a film coating of rubber by passage through a calender.—Ernest Hopkinson, New York, N. Y. United States patent No. 1,488,048.

MACHINE FOR SKIVE SPLITTING ANNULAR ARTICLES. Packing rings for piston rods, etc. are skive cut spirally between two revolving disks one of which is flexibly attached to the shaft. Each disk has cooperating pairs of projections and cut away portions forming a receiving recess for holding the article to be cut. By a cam roller the flexibly attached disk is inclined at various angles to its plane of rotation. In the gap between the disks is a rotary cutter for splitting the rings.—Cecil R. Hubbard, assignor to The Mechanical Rubber Co., both of Cleveland, Ohio. United States patent No. 1,488,120.

APPARATUS FOR MOLD CURING INNER TUBES. A tubular mold is arranged to receive an inner tube to be cured, the ends of the mold being closed by a self locking plug through which a valve stem projects, attached to one end of an expansible bag, placed within the inner tube and serving to expand it against the interior surface of the mold during the cure.—Will C. State, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio. United States patent No. 1,488,409.

TIRE PRESS VULCANIZER. Tire molds are spaced apart vertically by double wedges held outwardly by toggles. The molds may also be collapsed and pressure applied without removing the vulcanizer cover. The apparatus also allows preliminary vulcanization without molding pressure prior to the final vulcanization under pressure.—Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both of Massachusetts. United States patent No. 1,488,933.

APPARATUS FOR BUILDING RUBBER BOOTS AND SHOES ON LASTS. A number of hollow lasts are mounted on a tubular horizontal support, each last being swiveled to a sleeve whereby it may be turned up out of the way of the operator as he works upon the adjacent last from one end to the other of the apparatus.—Edward C. Williams and Joseph I. Taylor, Akron, Ohio, assignors to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,489,050.

Other Machinery Patents

The United States

1,489,922 Air-bag buffing machine. J. W. Brundage, assignor to The Miller Rubber Co., both of Akron, Ohio.

The United Kingdom

209,670 Tire building apparatus. E. C. R. Marks, 57 Lincoln's Inn Fields, London. (Fisk Rubber Co., Chicopee Falls, Mass.)

209,731 Vulcanizing apparatus for retreading tires. L. Miller, 130 Cantonment street, Freemantle, Western Australia.

210,149 Repair vulcanizer. H. Frost & Co., Ltd., 148 Great Portland street, London, and W. H. Welch, 182 Ashley Down Road, Bishopton, Bristol.

210,207 Tire repair vulcanizer. F. Pike, 73 Loughborough Park, Brixton, London, and C. J. E. White, 75 St. Saviour's Road, West Croyden, Surrey.

210,397 Apparatus for rubberizing cords and fabrics. E. Hopkinson, 1790 Broadway, New York, N. Y., and Morgan & Wright, Jefferson avenue, Detroit, Michigan, both in U. S. A.

Germany

Design Patents Issued With Dates of Issue

864,131 (January 4, 1924). Vulcanizing apparatus. Franz Schünemann, Sidonienstrasse 15, Leipzig.

864,428 (January 21, 1924). Spreading machine with cooling jacket for recovering solvent. Albert Boecler, Malmö, Sweden; represented by Dr. R. Specht, Hamburg.

865,907 (February 6, 1924). Exchangeable rubber heel. Ferdinand, Georg Willi Habenicht, Windmühlenweg 3, Leipzig.

Patents Issued With Dates of Issue

392,367 (February 5, 1921). Apparatus for making dipped seamless rubber goods. Albert Boecler, Malmö, Sweden; represented by Dr. K. Specht, Hamburg.

392,478 (January 14, 1923). Rubber spreading machine with device for balancing electric charges. Harry Schmidt, Amsterdamerstrasse 71, Cologne.

393,171 (September 2, 1922). Mold for heels and soles. Mitteldeutsche Gummiwarenfabrik Louis Peter A.-G., Frankfort-am-Main.

Austria

Published December 15, 1923

A.3760-22 Spreading machine. Martini & Hünecke, A. G., Berlin.

France

Patents Issued With Dates of Issue

565,012 (April 11, 1923). Improvements in tire building machines. Dickinson Cord Tire Corporation.

565,170 (April 17, 1923). Rubber cutting machine. A. Brillault.

565,878 (May 7, 1923). Machine for making pneumatic tires. Dickinson Cord Tire Corporation.

566,628 (May 23, 1923). Machine for making carcasses and casings for pneumatic tires. C. M. Gautier.

Process Patents

The United States

1,488,048 Method of manufacturing weftless fabric. E. Hopkinson, New York, N. Y.

1,488,343 Method of making tire casings. H. A. Hoffman, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,488,409 Method of and apparatus for curing inner tubes. W. C. State, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,489,477 Process for rubber patches. R. M. Bowes and C. E. Bowes, Indianapolis, Indiana.

1,489,867 Method of making blowout shoes. L. H. Voss, Detroit, Michigan.

The Dominion of Canada

238,900 Method of making semisolid tires. R. H. Waters, Cumberland, Maryland, assignor to The Kelly-Springfield Tire Co., New York, N. Y., both in U. S. A.

238,988 Process of making rubber boot legs. C. M. Hannis, Hudson, Massachusetts, U. S. A.

239,047 Method of making imitation leather employing a vulcanizable rubber compound. C. H. Dennison, Quincy, Massachusetts, assignor to The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec.

France

Patents Issued With Dates of Issue

562,866 (June 29, 1922). Process of manufacturing adhesive strips for repairing pneumatic tires. L. Rustin.

565,057 (April 12, 1923). Process and apparatus for repairing pneumatic tires. Virginia Carolina Rubber Co.

566,484 (May 19, 1923). Process of manufacturing rubber products. The New Jersey Zinc Co.

566,600 (May 23, 1923). Process and apparatus for making pneumatic cord tires. The Fisk Rubber Co.

Austria

Published December 15, 1923

A.3736-22 Process and apparatus for making round rubber thread. M. Draemann, Köln-Deutz, and M. Bühlin-Köln.

A.5496-22 Process for automatic repair of inner tubes. Charles Tournier, Paris.

Seiberling-State Tire Machine Patent Invalid

THE Supreme Court of the United States on April 7, 1924, ended the long protracted litigation over infringement of alleged basic patents protecting the Seiberling-Stevens-State tire building machine, commonly known as the Goodyear tire building machine, by announcing its failure to find invention in the State device either as a mechanical or as a method patent.

The United States patents involved were that of Seiberling and Stevens, No. 762,561, dated June 14, 1904, and of State, No. 941,962, dated November 30, 1909.

In 1914 suit for infringement was brought by Seiberling as assignee against the Firestone Tire & Rubber Co. The District Judge found both patents valid and infringed. The Firestone company appealed and the Circuit Court of Appeals for the Sixth Circuit in December, 1918, reversed the District Court, holding that all the claims of the State patent were invalid for want of invention and lack of combination, and that of the three claims of the Seiberling and Stevens patent, two were invalid and one was not infringed.

A similar suit was brought by Seiberling in 1914 against the John E. Thropp's Sons Co. After the decision in the Sixth Circuit, Seiberling filed in the Patent Office a disclaimer absolute as to eight claims of the State patent and qualified as to the other eleven. No proofs were made to sustain suit upon the Seiberling and Stevens patent, State, the patentee of the other patent, having testified that it had failed. The District Judge dismissed the bill on the ground that the effect of the disclaimers on the State patent was to change it from a machine to a method or process patent, and that the method was old.

On appeal to the Circuit Court of Appeals for the Third Circuit a majority of the Court held that the State patent as qualified by the disclaimers was valid and infringed.

It is this conflict of opinion between the Circuit Courts of Appeals for the Sixth and Third Circuits which has been settled in the Thropp suit against Seiberling to enjoin the infringement which the Supreme Court of the United States has settled by reversing the decision of the Circuit Court of Appeals for the Third Circuit and remanding the case to the District Court with directions to dismiss the bill.

Mr. Chief Justice Taft, in rendering the decision, reviewed the case at length, outlined the common method of building tires by hand and the principal power machines designed for that purpose, notably the Moore machine patented in 1894, the Seiberling and Stevens machine of 1904, the Vincent machine of 1905 and the Mathern machine of 1906.

The Seiberling and Stevens patent of 1904 for making tires sought to do the work of fitting the fabric to the core wholly by machinery, i. e., automatically without the intervention of the hand of the operator. It comprised:

(1) A main power driven shaft to drive the core capable of low or quick revolutions, or entire release.

(2) A reel carrying the rubber impregnated strip.

(3) A tension roller retarding the reel and stretching the fabric on the periphery after the free end is attached to the core.

(4) A pressure roller concave in form to match the tread of the strip and press it to the core as it revolves.

(5) An arm carrying a laterally spring-pressed finger called a jigger finger intended to be reciprocated rapidly, radially of the core, traveling in and out between the tread and in its outer edge, functioning like a human finger in pressing the fabric down against the core and stretching it into shape; and,

(6) A further pressure wheel or spinning roller applied along the edge of the fabric to press it into a crease. The spinning roller was set in a plane at a receding angle to the plane of the core.

The evidence shows that the Seiberling and Stevens' device was not successful in its operation and that the automatic operation of the finger was not effective.

The State patent was of the same general type as that of Seiberling and Stevens'. State's most substantial change was that he discarded the reciprocal, spring-pressed, in-and-out forming finger of Seiberling and Stevens and substituted spring-pressed spinning rolls which he supplemented with stitching rolls if needed. A revolving turret had four tools mounted at four equidistant points and independent of each other except for their common base. One carried a tread roller, the second the spinning rollers, the third the stitching rolls and the fourth the bead attaching rolls. The operator revolved the turret so as to make the tread roller bear against the tread on the core, then the spinning roll device, then the stitching roll and then the bead forming roll, the latter two of which were not always used. There was no real combination of the operation of the four tools. It was an aggregation not different from a successive use by an operator of hand tools, and so the Circuit Court of Appeals of the Sixth Circuit held. This was what led to the disclaimer of eight of the claims.

The eleven qualified claims are for combinations of a sheet fabric supply, a power driven ring core, including a slow speed mechanism for actuating the core when the fabric is received from the stock roll, and a high speed mechanism for the spinning rolls to pass over the fabric on the core and shape it, a radially moving support laterally spring-pressed toward the core, with a spinning roll mounted on the support to shape the sheet fabric to the core. The variety in the claims is in adding to the spinning roll the element of a receding angle to the place of the core, in giving the spinning roll a round disk shaped edge, in giving both the receding angle and the disk shaped edge to the spinning roll.

The Supreme Court concurs with the Circuit Court of Appeals for the Sixth Circuit in holding that there is nothing really new in the method of mechanism of State not fully anticipated in the method of making tires by hand or in the machines of Seiberling and Stevens, Vincent and Mathern. The steps are the same and the succession from one to the other are as in the manual art, while the transfer from hand to power is by the usual appliances and had all been indicated before the State patent.

Specifically the decision points out that there was no novelty in the combination of power-operated core with fabric rolls for delivering the rubber impregnated strips through tension rolls to the core, or in the use of pressure rolls to stretch and press the tread at the slow speed of the core followed by the spinning of the stretching or spinning rolls with high speed down the sides from the outer line of the tread to the bead edge of the fabric, or in the use of the tangential force upon the skirts of the fabric to keep them away from the core.

The operation of the spinning wheel was found to be only partly automatic and the springs pressing it against the fabric were not held to be patentable because of their inconsiderable importance and the use of similar springs in the Vincent and Seiberling and Stevens machines.

TWENTY MILLION TIRES IN DEALERS' HANDS

According to reports prepared by the National Tire Dealers' Association, there were approximately 20,000,000 automobile tires in the hands of dealers throughout the country on January 1, 1924, although such inventories have, it is stated, been reduced during the last three months.

Omaha and Trenton local organizations have recently become affiliated with the National Tire Dealers' Association, which maintains offices at 242 West 56th street, New York, N. Y., and is headed by George J. Burger.

Judicial Decisions

IN RE PLYMOUTH RUBBER CO. ATHERTON ET AL VS. WOODWARD, Baldwin & Co. Circuit Court of Appeals, First Circuit. November 22, 1923. No. 1645. In bankruptcy. Appeal from the District Court of the United States for the District of Massachusetts.

The trustees of the bankrupt Plymouth Rubber Co. appealed from an order of the referee in bankruptcy allowing the claim of Woodward, Baldwin & Co. for damages arising from the breach of a contract to take, and pay for, a quantity of cotton cloth. The trustees claimed that the evidence introduced by the claimant was competent as to actual value but not as to market value of the goods and therefore only nominal damages could be recovered.

The court considered the evidence of the expert witnesses sufficient and awarded damages to the claimant in the sum of $100, with double costs.

The decree of the District Court was affirmed, with double costs and $100 damages to the appellee.—*Federal Reporter*, Volume 293, No. 5, page 753.

FALLS RUBBER CO. VS. LA FON ET AL. No. 488-3884. COMMISSION of Appeals of Texas, Section A. December 12, 1923. Error to Court of Civil Appeals of Third Supreme Judicial District.

This case was originally instituted in the District Court of McLennan County, Texas, by Falls Rubber Co., an Ohio corporation manufacturing tires and accessories, against W. E. La Fon as its agent and M. W. Cabiness and T. F. Farmer as sureties, at Waco, McLennan County, Texas.

Defenses were that plaintiff was a corporation transacting business in Texas without a permit and not entitled to maintain a suit in Texas courts. Defendant's exceptions were all overruled; suit against Farmer was dismissed on account of his death and a verdict resulted for the plaintiff against La Fon and Cabiness.

On defendants' appeal the judgment of the district court was reversed on the ground that the rubber company was a foreign corporation doing business in Texas without a permit and a writ of error was granted by the Supreme Court. The Court of Civil Appeals held the transaction not one of interstate commerce on the theory that La Fon was an agent of the rubber company. The contention that part of the merchandise was sold outright was ruled upon adversely by the trial court and the commission held that the holding of the Court of Civil Appeals was erroneous and recommended that judgment be reversed and that of the district court affirmed. The judgment recommended in the report of the Commission of Appeals was adopted and entered as the judgment of the Supreme Court.—*Southwestern Reporter*, Volume 256, No. 2, page 577.

HEWITT RUBBER CO. VS. THOMPSON ET AL. No. 17885. SUPREME Court of Washington. December 10, 1923. Appeal from Superior Court, King County.

The respondent, Hewitt Rubber Co., manufactures automobile tires. The appellant George F. Thompson and W. L. Foard were copartners under the firm name of Tomford Tire Co.; the appellant George F. Thompson & Co. is a corporation largely controlled by the appellant Thompson. In 1919 the respondent and the Tomford Tire Co. entered into a written agreement by which the tire company was to distribute respondent's tires within the city of Seattle and other territory.

By March 24, 1920, the tire company owed the respondent $31,485.36, as evidenced by three trade acceptances, each for $10,495.12, drawn by the respondent and accepted by Foard for Tomford Tire Co. and by Thompson for George F. Thompson & Co.

On May 27, 1920, a conference was held between the respondent's representatives and the members of the copartnership regarding an adjustment of the business affairs of the copartnership. The trial court found that at this conference it was agreed that the copartnership and the appellants owed the respondent the total sum of the three trade acceptances, and that there were on hand tires worth $22,000 which should be turned over to the respondent and their net value credited to the partnership on the trade acceptances. The case was tried in court without a jury and judgment was given for the amount of the two trade acceptances, less $11,600.77. Judgment was against the tire company, the Thompson company and George F. Thompson, and the latter two appealed.

The Supreme Court ruled that at the time the contracts were made the appellants were liable on their trade acceptances and finding nothing to indicate that respondent released the appellants, the Supreme Court affirmed the judgment of the trial court.—*Pacific Reporter*, Volume 220, No. 5, 767.

Interesting Letters From Our Readers

Galalith for America

TO THE EDITOR:

DEAR SIR: The importance of your journal is so well known to me in my long experience as manager-engineer of one of the largest Continental rubber factories that I turn to you in the following matter, hoping that it may be of interest to you or your readers.

I have for years specialized in the manufacture of artificial horn (galalith) and know this line from its earliest beginnings. I have partly my own processes, but I can also work according to all other known methods. I am in a position to make on a commercial scale first class artificial horn in all the known imitations, such as tortoise-shell, ivory, amber, coral, buffalo horn, Irish (?) horn, etc.; and all uniform and transparent colors, in the form of sheets, rods or molded articles for the button, comb and other industries. At the present time the price comes to about 46 cents per kilo (2.2 pounds). Some of my newer processes, which are even better than those usually employed in Germany, could still be patented in the United States.

As engineer and experienced manager, I am in a position to plan and build a factory of the desired size, to train workers and direct the work. I have founded one of the largest German artificial horn factories and have directed it. However, I have resigned and hope to do better with my processes in another country.

If it should be possible for you with your far-reaching relations in the industry or through publicity in your periodical, to find parties interested in the manufacture of galalith in the United States, I am prepared to come to your country for this purpose. GALALITH.

Letters from those interested in the above communication will be forwarded to the writer.—THE EDITOR.

CRUDE RUBBER IMPORTS RANK FOURTH IN VALUE

The United States imports of crude rubber were 591 per cent greater in 1923 than in the pre-war period, or 692,468,000 pounds as compared with 100,179,000 pounds. Such imports for 1923 ranked fourth in value, at $185,058,000, among one hundred chief imports listed, while as a commodity, rubber represented 4.8 per cent of the total value of last year's imports. It also ranked in value 82 per cent above the similar importation in 1922.

Automobile tires, numbering in 1923 1,460,000 as compared with 1,381,000 in 1922, ranked as thirty-third in a list of one hundred chief commodities exported from the United States in 1923. The value of these casings is estimated at $17,669,000.

Activities of the Rubber Association of America

Board of Directors Meeting

THE Executive Committee of the Board of Directors of the Rubber Association met at the Lotos Club, New York, N. Y., on April 17, when consideration was given to matters of a routine nature concerning association activities.

Committee Meetings

The Executive Committee of the Rubber Sundries Manufacturers' Division met at the Union League Club, New York, N. Y., Tuesday evening, April 1. A slight change was made in the plan of registering with the association trade names adopted by members. The plan has prevented the duplicate use of specific names.

A general discussion was had on the imports of foreign rubber sundries, its effect upon the domestic industry and the possibility of making effective the Anti-Dumping Act to improve the situation. Information on this subject secured by the association will be turned over to the Anti-Dumping Unit of the Customs Information Exchange to aid in the investigation of this matter.

The Executive Committee approved a standardization plan with respect to sizes, colors, packing, etc. for bathing slippers which was recommended by the Bathing Slipper Committee of the Division. The committee also approved the suggestion that some co-operative educational publicity work be undertaken relative to the use of hot water bottles, etc., in the home. This question is to receive further consideration at the next meeting.

The Traffic Committee held its regular monthly meeting at the Yale Club, New York, N. Y., April 7 and 8. On April 8 the committee also appeared before the Consolidated Freight Classification Committee in connection with the ratings on various rubber articles. The committee will hold its regular May meeting in Boston on May 20 and 21.

The carriers in Middle Atlantic territory soon will propose to the Interstate Commerce Commission that it institute a general investigation of the class rates applying within trunk line territory as well as between that territory and New England and central territories. This investigation is of much interest to the rubber industry because of its effect upon the transportation charges applicable to both raw materials and finished products.

The regular monthly meeting of the Tire Executive Committee and the regular quarterly meeting of the Tire Manufacturers' Division have been postponed.

The Service Managers' Committee met at the office of the Tire & Rim Association, Cleveland, Ohio, April 3 and 4, when consideration was given to the revised Standard Tire Warranty which will go into effect May 1. Consideration was also given to the display poster proposed to be distributed to tire dealers in connection with the revised warranty as well as letters to tire manufacturers and dealers explaining the revised warranty.

The next meeting of the committee, to be held at the Hollenden Hotel, Cleveland, Ohio, May 6, at 10:00 a. m., will be an adjustment conference on the new 90-day warranty for pneumatic tires. Representatives of members of the Tire Manufacturers' Division will be invited. There will be brief talks by General Manager Viles, Chairman Duncan of the Tire Manufacturers' Division and several members of the Service Managers' Committee regarding the different phases of the revised warranty, methods for making it effective and how to enlist dealers' support.

Responses received from members of the Tire Manufacturers' Division indicate that there will be a large attendance at the conference and that tire manufacturers are keenly interested in the activities contemplated by the Service Managers' Committee in connection with the inauguration of the revised warranty.

Recommendations of Tire Executive Committee

The Executive Committee of the Tire Manufacturers' Division, at its meeting on March 26, recommended for approval of the Division that the Standard Tire Warranty be revised so that all pneumatic tires be warranted free from defects in material or workmanship developing within ninety days from date of first road wear. The revised warranty requires that claims for defective tires must be filed by the original user within the ninety-day period, or within five days thereafter.

The Executive Committee also recommended that the revised warranty be made effective May 1, 1924. No change was made in the present warranty covering solid or cushion tires.

At the same meeting a discussion of the desirability of adopting a schedule of load carrying capacities and inflation pressures for balloon tires indicated that it would be impracticable for the Executive Committee to recommend a standard schedule for use by tire manufacturers.

The committee recommended to members that inflation pressures for balloon tires be measured on the basis of a tire deflection of approximately 22 per cent, which is believed to be the most accurate method of insuring proper inflation.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

	Pneumatic Casings				Inner Tubes				Solid Tires			
1922	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
Twelve months 1922	..	58,401,086	30,698,139	29,221,899	..	72,463,938	38,137,181	36,656,435	..	2,320,650	786,603	688,845
Twelve months 1923	..	67,448,419	33,933,936	32,991,810	..	87,807,770	45,128,083	43,554,963	..	3,013,674	692,148	690,090
1923												
February	60	5,224,387	3,217,987	2,588,639	60	6,771,958	4,039,202	3,001,697	11	270,191	75,457	63,394
March	58	5,670,601	3,865,726	3,322,637	57	7,740,945	4,875,414	3,828,315	11	265,843	79,788	77,144
April	56	6,088,272	3,539,326	2,976,160	55	8,394,184	4,259,558	3,535,635	10	260,631	71,468	72,609
May	57	6,906,594	3,659,986	2,757,764	57	9,292,223	4,317,537	3,414,115	10	268,323	77,288	67,147
June	55	7,040,600	2,956,943	2,502,185	54	8,924,326	3,590,011	3,581,060	10	283,425	72,445	52,126
July	54	6,471,124	1,992,989	2,539,425	52	7,527,281	2,666,354	3,942,247	10	263,891	42,345	45,219
August	58	6,058,387	2,355,915	2,807,432	53	6,950,578	3,577,922	4,304,034	10	262,810	48,141	45,925
September	60	5,397,557	2,029,581	2,623,775	55	6,457,455	3,254,575	3,663,574	10	249,379	37,074	45,971
October	59	4,876,352	2,361,340	2,819,583	55	6,898,425	3,855,244	3,595,737	10	234,945	37,285	48,065
November	55	4,689,329	2,399,725	2,456,296	53	6,693,639	3,451,716	3,422,426	11	213,686	32,577	49,471
December	56	4,329,300	2,437,148	2,603,617	52	6,318,446	3,288,665	3,497,472	10	178,088	34,937	62,408
1924												
January	56	4,808,084	3,220,292	2,785,335	51	6,720,247	3,887,959	3,475,713	10	182,782	53,604	43,375
February	55	5,265,133	3,278,674	2,771,000	50	7,339,307	4,067,631	3,329,504	10	188,519	60,646	49,370

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month. "Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis or abroad.

(*Compiled by The Rubber Association of America, Inc.*)

New Goods and Specialties

Tires for Steering Wheels

AN automobile accessory which is not only comfort-giving and attractive but is inexpensive as well is featured in the Rid-Ged Grip steering wheel tire illustrated. These tires are made in two sizes, large and medium; the No. 1 to fit all 17 and 18-inch wheels and the No. 2 for all 15 and 16-inch wheels, including Ford standard. They are made considerably smaller than the steering wheel and must be stretched to fit and adjusted to position to equalize the tension, thus insuring a tight hold without the use of glue or other fastening means. A sure and easy grip is thus provided, with or without gloves, and the wheel is improved in appearance and more comfortable to handle both in winter and summer weather.—The Rid-Ged Grip Co., Akron, Ohio.

Rid-Ged Grip Steering Wheel Tire

Resilient Disk Wheel

The construction of a new fabric and rubber plied resilient disk wheel comprises a radial cross-section extending from hub to rim. The disk portion is constructed of 16 to 18 layers of rubberized tire fabric vulcanized into a one-piece resilient disk which is reinforced by a riveted flat steel plate which leaves intervals of a half inch on either side toward hub and rim. An inner thin flat steel plate lays over these open spaces to protect the fabric. These plates are not riveted. Any blow on the rim is cushioned by the rubber and fabric structure at the spaces. The entire disk of the wheel serves as a cushion and effectually absorbs all road shocks. —The Milan Tire Co., Morgantown, West Virginia.

Two New Miller Products

The red devil toy and the geographic ball illustrated herewith are two of the Miller products which were exhibited at the recent toy show in New York city. These are of first quality molded rubber, and the ball has additional value for educational purposes in that it is a perfect representation of the globe, the different countries being brought out slightly in relief and in colors. The red devil is also of hollow molded rubber, and is realistic enough in appearance to be a veritable "bogey-man," being about ten inches in height.—The Miller Rubber Co., Akron, Ohio.

Geographic Ball

Red Devil Toy

A NEW INDOOR GOLF GAME CALLED "TOM, DICK AND HARRY," or "Rce-Tee," is being marketed by the Dunlop Tire & Rubber Co., Toronto, Ontario.

"Madame X" Reducing Girdle

A girdle made entirely of rubber specially prepared to gain maximum resiliency and wearing quality is designed to take the place of an ordinary corset and at the same time gently and continuously massage the hips and abdomen. The girdle is provided with side garters and is said to outwear the usual coutil corset.—The Thompson-Barlow Co., Inc., 404 Fourth avenue, New York, N. Y.

New Firestone-Apsley Gaiter

During the style show of the National Shoe Retailers' Association held in Chicago, February 11-14 of this year, the "Sheba" gaiter, illustrated, a Firestone-Apsley product, was awarded the medal of merit. The trim fit of this gaiter and its simple, attractive fastening, without any skirt-catching hooks, are its special features. The generous overlap and the buckled strap make it easily adjustable to any size, and an additional ornamental feature may be introduced by having the monogram engraved on the buckle. The advance business already booked on this gaiter proves that the trade accepts the prophecy of the manufacturers that it will be more than a mere novelty of the season.—The Firestone-Apsley Rubber Co., Hudson, Massachusetts.

The "Sheba" Gaiter

Adjustable Bath-Spray Fixtures

A device for adapting bath sprays to any size of faucet is being shown by stores dealing in druggists' sundries. It is made of red rubber to fit on the faucet and is fitted with metal screw tip to take the hose of the spray. At the top edge that goes over the faucet is a flange of the rubber below which is fitted a metal ring that ends in a thumb-screw. By screwing it up the ring is tightened to fit small faucets. A patent is pending on the device. —James A. Hetherington, 53 East 42d street, New York, New York.

Combination Tobacco Pouch and Cigarette Maker

The latest addition to devices for convenience of smokers is a tobacco pouch of rubberized material, incorporated in which is a tube for forming cigarettes. A little plunger concealed in the tube packs the tobacco automatically in the paper which has been sealed around the tube in the cigarette-making process. When the cigarette is made the tube is pushed back up into the pouch and capped to hold it in place. A pipe may be filled through the tube in the same way or through the flap at the top of the pouch.—Master Tobacco Pouch Co., 108 South 13th street, Philadelphia, Pennsylvania.

Dual Cigarette Maker and Tobacco Pouch

Device for Measuring and Weighing Golf Balls

The sporting goods dealer will welcome this little golf ball scale, which determines accurately and in a second of time whether or not a ball conforms to standard specifications. Frequently balls of the self-same lot will vary considerably in dimensions, enough to make a difference in the game of the scientific player; therefore, each ball must be weighed and measured individually for the professional. When a ball is placed on this scale a glance tells whether it exceeds the specified 1.62 ounce weight or falls below the allowed minimum of 1.62 inches diameter.—John Chatillon & Sons, 85-89 Cliff street, New York, N. Y.

Golf Ball Scale

Rubber Belting With Flexible Center

The trade name "Serubco" has been adopted for a patented rubber belting with a flexible center to compensate for the crown in pulleys when used for transmission purposes to run at varying speeds and over small drive pulleys. The method employed in manufacture substitutes a high quality rubber strip longitudinal with the belt, and in its center, in place of cotton duck. The results accomplished give a hinge effect to the cross-section of the belt when under tension on pulleys and allows operation over small pulleys and at very high speed with no danger of ply separation and an increase of horsepower developed. —The Security Rubber & Belting Co., 2837 South La Salle street, Chicago, Illinois.

New Laminated Cushion Tire

The manufacturers of the Roden laminated tire claim that thousands of miles of actual usage have proved its easy riding, shock-absorbing, blowout proof, puncture proof, heat resisting, non-skid, and exceptionally durable qualities. The core is made up of a series of laminations of inner tube stock set on the end of the rubber grain. Each laminated disk is cured into the fabric, which in turn is cured to the sidewall and tread of the casing. The fractional laminations, it is claimed, produce great flexibility and impart a riding ease equal to an air tire inflated to less than 38 pounds pressure. The end of the laminations nearest the rim is bound by an additional strip of fabric between two layers of cushion gum, while surrounding the lamination is a covering of the gum, and down the back of the carcass is an additional strip of it. An extra strip covers the tread portion, on top of which is the breaker strip, and enveloping the breaker and the fabric is another layer of the gum, which is cured to the tread and sidewall rubber. Four layers of fabric and a base encase the carcass of the 30 by 3½ sizes.—Roden Laminated Tire Co., Grand Rapids, Michigan.

Roden Laminated Tire

A Platform-Pedal Combination

The exclusive feature of the new type of scooter illustrated is the combination platform-pedal and clutch device, which enables the rider to get the same muscle exercise as when riding a bicycle, and insures a maximum speed and safety. The clutch device prevents the vehicle from running backwards, so that if the rider ceases pedaling it simply stands still, even on a hill. The platform-pedals have non-slip corrugated rubber pads of generous size. The frame is of ¼-inch steel and the wheels are of stout metal stampings provided with oversize clincher tires. Finished in bright red and yellow, it makes an attractive display item. The sole eastern selling agents are Kaufman, Levenson & Co., 7 East 17th street, New York, N. Y.—The Go-Boy Corporation, Cleveland, Ohio.

The "Go-Boy"

Rubber Aprons for Mah Jong

The latest development of the rubber apron is its adaptation for Mah Jong playing. The body of the apron is cut from red or green sheet rubber and trimmed with applied bands of cretonne in Chinese designs. There are also pockets of the cretonne. These aprons are being shown by leading department stores.

Dunlop Cushion Tire for Trucks

The new Dunlop product illustrated was designed to give to trucks a maximum cushioning at the least possible sacrifice of load-carrying capacity. It is claimed that wheel wobble is overcome to a high degree and that steering is easier. Through the center of the tire is a typical Dunlop mileage strip, and on each side and placed at angles are road-gripping blocks similar to those on the company's standard solid non-skid. The cushion, or air chamber, which runs through the center of the base just above the corrugated rim on which it is mounted is said to eliminate the hot spot or fatigue area which in ordinary tires is the first place to become overtaxed.—Dunlop Tire & Rubber Co., Buffalo, New York.

Dunlop Cushion Tire

DAVID MOSELEY & SONS, LTD., CHAPEL FIELD LANE, ARDWICK, Manchester, England, have patented a device for simplifying the fastening of the rubber bladder in inflated footballs. A slotted metal plug fits into the flexible nozzle of the bladder and when this is in position a rubber ring is rolled up from the base of the nozzle to engage the slot and make the junction airtight. The nozzle is then pressed down into the bladder until the top of the metal cap is flush with the bladder surface.

Cover Fastener for the Baby's Bed

The exclusive patented feature of the cover fastener illustrated is the clasp, which is simple, strong, durable, and will not work loose of itself, though it is attached or removed in an instant. There are no points or corners to tear the bed clothes or injure the child in any way. The elastic bands which loop around the bed posts are resilient enough to allow for freedom of movement, so that though the covers cannot possibly be kicked off, there is no sense of restriction.—Universal Cover Fastener Co., 125 East 23rd street, New York, N. Y.

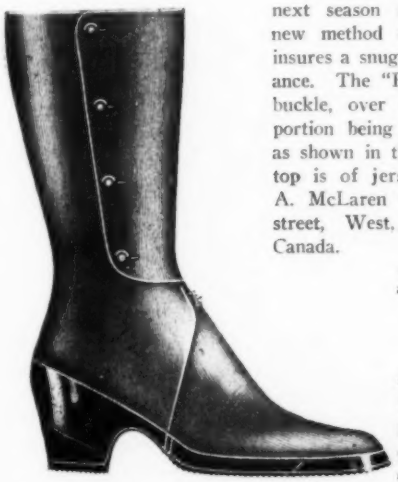
Universal Cover Fastener

Rubber Decoy Ducks

Inflatable Decoy a Perfect Facsimile

The rubber inflatable decoy illustrated will displace the wooden duck in the equipment of the duck shooter who must carry his decoys to and from the shooting grounds. A number of these decoys may be rolled up together and carried in the coat pocket. A good grade of rubber is employed in the construction, with lightness and durability as prime considerations. It is claimed that it holds its shape without frequent re-inflation and that it will not sink if punctured. Suitable ballast is provided to prevent the decoy from slashing around in a heavy wind, though not preventing it from riding high on the water and presenting a lifelike appearance.—The Leyland & Birmingham Rubber Co., Ltd., Leyland, near Preston, England.

New Fastening Arrangement for Gaiters



The "Patric" One-Buckle, Four-Button Gaiter

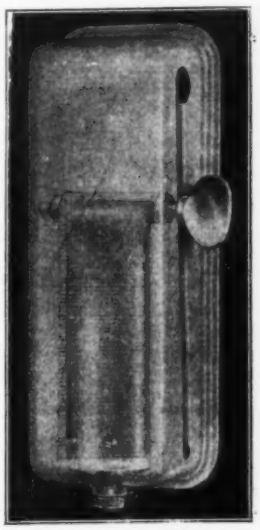
The advance styles in gaiters for next season show one distinctly new method of fastening, which insures a snug fit and trim appearance. The "Patric" has only one buckle, over the instep, the leg portion being fitted with buttons, as shown in the illustration. The top is of jersey, fleece lined.—J. A. McLaren Co., Ltd., 30 Front street, West, Toronto, Ontario, Canada.

"Treotex" Elastic Corset Fabric

The manufacturer of the Treo girdle has brought out a new patented surgical elastic web especially designed for an elastic corset fabric. It is called "Treotex" and is said to combine strength in the elastic strands and ingenuity in construction.—Treo Company, Inc., 267 Fifth avenue, New York, New York.

Device for Holding Tubes of Cement

When the tube of tire repair cement is held in the cabinet illustrated and rolled down with a key as it is used the inconvenience and unpleasant features connected with handling it are practically eliminated. The cabinet may be attached to any convenient wall. By means of a strong tape, one end of which is attached to an outside key, the tube is rolled up as the key is turned, and in this way every bit of the cement may be utilized. When enough for any one job has been obtained the device closes the tube, thus preventing the cement from leaking or drying up in the tube. It is claimed that there is no danger of breaking the tube after it has been inserted in the device and that there is no way by which it can get out of working order.—Joel E. Hawley Co., 310 Altman Building, Kansas City, Missouri.



Cement Tube Holder

Rubber Bone for Dogs

The rubber "bone," about which inquiry was made to this department some time ago, may now be obtained "Made in U. S. A.," although it is said that the original novelty was imported from France. The "bone" is molded in a good quality of gray rubber and is handled by sporting goods stores.—United States Rubber Co., 1790 Broadway, New York, New York.

Practical Syringe Radiator Tester

The Pyro-Alcohol Radiometer

The Pyro-Alcohol Radiometer is a sturdy, accurate radiator tester in which the best grade of rubber is used throughout, and which has as its distinguishing feature an 8-inch rubber nozzle for convenience in drawing solution from the radiator. A square collar of rubber protects the glass parts from breakage. The float is graduated from +30 to —45, which indicates the temperature at which the solution will freeze. Each instrument is packed in an individual mailing tube.—Scranton Glass Instrument Co., Scranton, Pennsylvania.

An Elastic Tire Cover

The idea of an elastic tire cover is not entirely new to the rubber trade, but the difficulty has been in producing one which would withstand the sun and weather. The Reilly Rubber Co. claims that its recently patented cover has as its special feature the desired weather-resisting quality. Other characteristics are a wrinkle-less fit over either old or new tires; easy application and removal; no hooks, buttons, straps or buckles; and only four sizes to carry in stock.—The Reilly Rubber Co., 2432 East 56th street, Los Angeles, California.

"Jumbo" Hydrometer

A large hydrometer for battery testing is called the "Jumbo" and is fitted with a rubber bulb, rubber tube and rubber float.—Stadecker Manufacturing Co., 123 South Jefferson street, Chicago, Illinois.

The Editor's Book Table

Book Reviews

"THE EVOLUTION OF THE WORLD RUBBER SITUATION." BY H. Stuart Hotchkiss, vice-president of the United States Rubber Co., president of the General Rubber Co., and president of the United States Rubber Plantations, Inc. Reprinted from the Harvard Business Review, Cambridge, Mass., edition of January, 1924. Paper, 10 pages, 7x10½ inches.

An accurate and very readable summary for the busy student of the remarkable development in less than a century of a virtually new commodity and the curious vicissitudes of the trade. The heyday of wild rubber, and with its decadence the creation and rise of the plantation industry with its 3,500,000 acres, the practical elimination of doubtful grades and the virtual standardization of crude rubber quality on plantation grades, as well as the passing of Brazilian dominance to four-fifths British control, are well outlined.

Interesting, too, is the author's description of rubber factoring in London and New York, the once-famous wild rubber monthly auctions in Antwerp, Bordeaux, and Amsterdam, the fortnightly plantation rubber auctions in London, the introduction since the war of weekly auctions in Singapore and Ceylon due to the desire of American consumers to get raw material near bases of supply and to eliminate London costs, and latterly the marketing of rubber in a liquid as well as a solid state, that is, as original latex, the price for which is determined chiefly by the solid content and the London market for crude in sheets.

The Stevenson restriction act, which the author regards rather as a balance wheel than a monopolistic measure, is defended as the better choice of two evils, that is, unfettered, disorderly competition at ruinous prices with a cessation of new planting for future needs or well-ordered selling at fair prices with consequent encouragement of extended rubber growing. Much of the criticism of the British policy he attributes to a lack of knowledge of the cost of producing rubber and of the tropical risks and the long wait for returns on new planting.

As for the proposal that "America should grow its own rubber," the author says that he appreciates its strong sentimental appeal, but he warns enthusiasts of the natural limitations of rubber culture as well as the financial pitfalls in the path of practical realization of such an ideal. To meet the military objection to depending upon foreign growers, he would have a revolving rubber reserve held in the United States, and equal to about a year's supply. World shortage of rubber, he believes, will never be more than temporary; and the surest provision for abundant supply, in his opinion, is a price that will warrant continued investment in and extension of efficient plantations.

"LEAD, THE PRECIOUS METAL." BY ORLANDO C. HARN. PUBlished by The Century Co., New York and London. Cloth, illustrated, 323 pages, with index, 5½ by 8 inches.

Prepared in popular style and in an attractive form, this volume furnishes much information regarding not only the mining and smelting of lead, but also its use in the various industries. One of the twenty-three chapters is devoted to a study of the use of lead in rubber manufacture, while other sections of the book contain accounts of the production of red and white lead, litharge, lithopone, and other lead compounds which have become necessary in the rubber industry.

"YIELD AND GROWTH IN HEVEA BRASILIENSIS." BY G. Bryce and C. H. Gadd. Department of Agriculture, Ceylon, Bulletin No. 68. Published by H. Ross Cottle, Government Printer, Colombo, Ceylon. Paper, 74 pages, 5¼ by 8½ inches.

This bulletin represents a continuation of the report concerning former tests made during the tapping year 1921-22 at the Peradeniya Experiment Station in connection with 161 high yielding Hevea trees. Six of these trees having practically ceased yielding latex since the publication of the first bulletin, the present investigation, for 1922-23, is based on results obtained from the remaining 155 trees. Much detailed information and a number of comparative tabulations have been prepared.

"BALLOON TIRE SURVEY." PUBLISHED IN *TIRES*, MARCH, 1924. Edward Lyman Bell, Inc., 383 Madison avenue, New York, N. Y.

We cannot refrain from commenting again upon this exceedingly complete and timely addition to tire literature. In some thirty pages of text is given the views and experience of all of the leading tire manufacturers, together with interviews and ideas from 10,000 tire retailers. This is supplemented by practical information upon such topics as inflation, load capacity, clearance, air capacity, sizes, wheel changeover, replacement instructions with diagrams, prices, and so on. Taken as a whole it is one of the most valuable contributions to tire literature that has yet appeared.

New Trade Publications

AN UNUSUALLY LARGE CATALOG CALENDAR, ITS TWELVE LEAVES containing many illustrations of the company's products as well as interior views of the factory, has been recently presented by The Miner Rubber Co., Limited, manufacturer of rubber footwear at Factory Granby, Quebec, Canada. The calendar is printed in color, and has several original and attractive features.

IN THE ILLUSTRATED BOOKLET ENTITLED "STATIC CONDENSERS for Power Factor Correction," recently prepared by The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, the methods of obtaining high power factor are discussed, while the method of selecting the proper corrective device for power factor has been carefully analyzed. Diagrams representing the fields of application of synchronous and static condensers, and statistical data regarding the weights, dimensions and losses of static condensers and the weights and dimensions of transformers, are included.

A WELL ARRANGED AND FULLY ILLUSTRATED BOOKLET ENTITLED "Power Plant Lubrication," has been recently issued by the Tide Water Oil Sales Corporation, 11 Broadway, New York, N. Y. Various divisions of the publication are headed: "Friction and Lubrication"; "Testing of Lubricants"; "Bearing Lubrication"; "Steam Engine and Turbine Lubrication," etc. Although discussion of various mechanisms are purposely reduced to a minimum, the treatise, which aims to cover the latest developments in the lubrication of power plant machinery, contains some important information regarding generators and motors, Diesel and semi-Diesel engines, and auxiliary machinery.

ONE OF THE LATEST ISSUES OF "THE WEATHER VEIN," PUBlished by the Carrier Engineering Corporation, Newark, New Jersey, is devoted to an illustrated description of the Wrigley chewing gum industry, and the developments and various processes maintained at Mr. Wrigley's great Chicago plant. This factory, and also subsidiary ones, are equipped by the Carrier organization with "Manufactured Weather."

THE LATEST CATALOGUE ISSUED BY LOCKWOOD, GREENE & CO., 24 Federal street, Boston, Massachusetts, and entitled "Industrial Power Plants," is attractively illustrated by photographs representing examples of equipment installed by this well-known engineering organization for the Hewitt Rubber Co., the Canadian Consolidated Rubber Co., Limited, and five subsidiary divisions of the United States Rubber Co.

THE "ZENOPAC" PRODUCTS OF THE PALMYRA PACKING CO., INC., Palmyra, New York, have been well set forth in the company's latest illustrated catalog. Many of the pump valves, gaskets, and various types of packing represented include in their composition a high grade rubber or rubber compound.

THE TIRE MANUFACTURERS' DIVISION OF THE RUBBER ASSOCIATION of America has recently issued a small booklet entitled "The Care of Pneumatic Tires." Included in this booklet are a number of illustrations representing various types of tire misuse, while the text accompanying furnishes information applicable to the handling of all makes of tires, and based on the experience of the whole industry, and not of one particular company.

THE LATEST CATALOG ISSUED BY THE EAGLE RUBBER CO., Ashland, Ohio, is printed in color, and its many illustrations are so arranged as to display the company's "Eagle Brand" products, which include rubber balls, toy balloons, and novelties.

APPARENTLY VERY COMPLETE INFORMATION REGARDING THE service and application of balloon tires has been prepared by the Miller Rubber Co., Akron, Ohio, in a recent illustrated issue of the company's monthly "Tire Trade News," entitled "Special Balloon Tire Edition." A number of charts representing comparative measurements of balloon tires and the tires they are replacing are included in this bulletin as well as several tabulations supplying data as to the application of balloon tires to present rims.

A SPRING BULLETIN ENTITLED "RUBBERWARE SALES" HAS BEEN recently published by the Reliance Rubber Co., Limited, 212-213 Upper Thames street, London, E. C. 4, England. Illustrations show the company's varied line of rubber goods, particularly garden hose. The bulletin, printed on rubber latex paper, has been edited by Fordyce Jones.

THE FIRST ISSUE OF "PUBLIC ROADS," AN ILLUSTRATED JOURNAL devoted to highway research, has been recently published by the United States Department of Agriculture, Bureau of Public Roads, Washington, D. C. In this publication are several interesting articles, among which are "The Connecticut Highway Transportation Survey," "The Flow of Water Through Pipe Culverts," "Road Material Tests," "Inspection News," and others.

Recent Articles Relating to Rubber

Standard Methods for the Analysis of Rubber Goods. Methods unanimously adopted by the Committee on Methods of Analysis of the Division of Rubber Chemistry and Sub-Committee XI of D-11, American Society for Testing Materials. These methods have been recommended for adoption as the tentative standard procedure for the last named society. They include (1) reasons for the analysis, (2) preparation of sample, (3) reagents, (4) method of analysis, (5) acetone extract, (6) chloroform extract, (7) alcoholic alkali extract, (8) free sulphur, (9) total sulphur, (10) alternative method for total sulphur, (11) ash, (12) sulphur in ash, (13) barium sulphate, (14) total antimony, (15) antimony in the ash, (16) free carbon, (17) detection of glue, (18) unsaponifiable matter, (19) hydrocarbons A and B, (20) rubber hydrocarbons by Joint Rubber Insulation Committee's Method, (21) cellulose, (22) barium carbonate, (23) calculations, (24) rubber as compounded, (25) rubber by volume, (26) statement of results.—*Industrial and Engineering Chemistry*, April, 1924, 397-402.

Resistance of Pigmented Crêpe Rubber to Atmospheric Influences, Particularly Sunlight. Raw crêpe rubber is susceptible to atmospheric influences, particularly sunlight, which causes rubber to become tacky and resinous. Vulcanized rubber hardens and perishes under similar conditions. For protection of vulcanized rubber, orange dyes and vegetable or carbon black have been incorporated in the rubber. Their effect is to absorb or dissipate those light rays which cause the chemical decomposition of the rubber. Carbon black is preferable to coal tar dye as the latter is gradually bleached by the action of sunlight and eventually becomes useless. It has been shown experimentally that carbon black is extraordinarily efficient in protecting raw crêpe rubber from sunlight.—Henry P. Stevens. *Rubber Growers' Bulletin*, January, 1924, 52-54.

Sprayed Rubber—Fifth communication. Breaking down test showed that latex sprayed rubber resists breaking down much more than ordinary plantation crêpe. Under like compounding, curing and aging conditions the tensile properties of plantation crêpe showed higher values.—Henry P. Stevens, *Rubber Growers' Bulletin*, January, 1924, 54-55.

The Aging of Rubber. Discussion of effects of cure and oxidation on aging quality of rubber; accelerated aging; relation between aging and the physical properties of rubber; effect of compounding ingredients; methods for the preservation of rubber. Some vulcanizing agent or perhaps a new organic accelerator may be discovered which will yield a vulcanized rubber of comparative stability. If this can be done and immunity from oxidation secured by the use of an anti-oxidant the result would be a truly permanent rubber.—Sidney A. Brazier. Paper read before the Institution of Rubber Industry, January 23, 1924.

Rubber Lined Container for Chemicals. Illustrated. Description of rubber lined barrels for shipment of acids, etc.—*Chemical Age*, March, 1924.

Preparing Ebonite for Machining—L. C. K., *Machinery*, February 21, 1924, and *The India Rubber Journal*, March 15, 1924, 9-11.

The Mechanical Structure of Rubber. Discussion of the particle shape of rubber in latex; the mechanics of coagulation; grain structure induced by technical manipulation; structure of vulcanized rubber and its relation to physical and thermal properties of the cured product; and speculations on the spheroidal theory.—R. W. Lunn. Paper read before the Institution of the Rubber Industry, Manchester Section, March 17, 1924.

New Evidence as to the Existence and Nature of Calender Grain. Calender grain is generally recognized by shrinkage on heating and possession of different tensile properties along the direction of calendering and across it, and by the fact that it tears more easily in one direction than the opposite. These observations indicate that the rubber has been converted from an isotropic to an anisotropic substance by calendering and a state of strain set up in the material. Material whose elastic properties vary in different directions are capable of polarizing light. The author has demonstrated that calendered rubber sheet exhibits this behavior and does not show it after releasing the strain by heating. If any solid materials of irregular particle size are present in the rubber, a small variation in tensile properties in different directions will be observable, owing to orientation of the particles in one direction.—W. M. Ames, *The India Rubber Journal*, March 1, 1924.

Determination of the Activity of an Accelerator of Vulcanization. Using a mixture of rubber (90), zinc oxide (90) and sulphur (5—10) it is found that doubling the proportion of an organic accelerator present increases the rate of combination of rubber and sulphur by about 30 per cent. The more rapid the rate of this combination the less is the extent of chemical change necessary to induce the associated physical alteration in the rubber. The term "potency" is suggested for the value of the acceleration factor observed for 1 per cent of any organic accelerator with the above type of mixture; it can be calculated from the results with other percentages by the expression $k A^{1/n}$, where k is the acceleration factor, A the percentage concentration of the accelerator in the rubber, and n is approximately 2.6.—G. Martin and W. S. Davey, *Journal Society of Chemical Industry*, February 22, 1924, 31T-34T.

Costing in the Rubber Industry. Outline given and advantages indicated of a scientific cost system in manufacturing.—C. A. Fryer before the Manchester Section of the Institution of the Rubber Industry, November 19, 1923.

Special Soft Rubber Rolls for Paper Machines. An account of the satisfactory services rendered by special soft stock press and other rubber covered rolls used on paper machines for the extraction of water from the paper in process. Roll corrugation is eliminated and the machine felts last much longer.—R. H. Whitney, The B. F. Goodrich Rubber Co., paper read before the Technical Association of the Pulp and Paper Industry, Paper Industries Exposition, New York, April 10, 1924.

Effect of Certain Anti-Oxidants on the Aging of Vulcanized Rubber. (Italian.) The addition of pyrogallol in a mixture containing only sulphur increases the resistance of rubber to aging but greatly retards vulcanization. In the presence of zinc oxide aging is facilitated; vulcanization is retarded if the zinc oxide content is low, but is accelerated if this is much higher. In combination with organic accelerators similar results are obtained.—Camillo Pelizzola, *Giornale di Chimica Industriale ed Applicata*, February, 1924, 59-60.

Laying Out Seed-Gardens by Combining Selection of Mother Trees with Vegetative Propagation. Twenty-four carefully selected mother trees, yielding on an average 21 grams of dry rubber per tree per tapping, furnished budding material for two experimental gardens. The first harvest is expected in February-March, 1925.—D. J. N. van der Hoop, *Archief voor de Rubbercultuur*, February, 1924, 86-91, tables.

Rubber from Buddings—Variability of Rubber from Individual Buddings Compared with Rubber from Seedlings. Dr. O. de Vries, *Archief voor de Rubbercultuur*, March, 1924, 113-126. Tables. English summary, 127-129.

On a New Accelerator. (French.) Experiments with 1-4-diphenylendanilinodihydrotriazol, commercially known as nitron, show that it is almost as powerful as triphenylguanidine. With both substances acceleration is greatly increased by the addition of small quantities of ammoniacal compounds. Nitron is also a good accelerator even in the total absence of zinc oxide.—Egidio Romani, *Le Caoutchouc et La Gutta Percha*, March 15, 1924, 12, 41.

Formulæ for Rubber Mixings. (French.) Continuation of serial article: Mixings for brown cloth, red billiard bands, shock absorbers, Chatterton compounds and packings.—Dr. R. Ditmar, *Le Caoutchouc et La Gutta Percha*, March 15, 1924, 12,120-12,123.

Lining and Covering Bodies with Hard Rubber—III. Process details.—Ludwig Füllsack, *Gummi-Zeitung*, February 29, 1924, 344-345.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(381) From Japan comes an inquiry for sources of supply in the United States of cut soap bark and Cumar resin.

(382) We are asked for the address of a manufacturer of rubber flooring.

(383) Information is asked as to where compounded sheet rubber of the thickness of heavy dental dam may be obtained.

(384) A subscriber desires information concerning Chatterton compound.

(385) We are asked for a source of supply of quick drying ink for branding red sheet packing.

(386) Request is made for a list of English or German manufacturers who could furnish from 5 to 10 pounds each month of solid tube sponge rubber made in continuous lengths up to 1,000 feet, in 5/8, 1/2, 3/8, 1/4 and 3/16-inch diameters.

(387) Inquirer desires to locate source of supply of isoprene.

(388) We are asked where a machine for testing the hardness and resiliency of rubber may be obtained.

(389) Lists of manufacturers of rubberized gingham, percale and cretonne for women's aprons are asked for, and also manufacturers of black stock on drill, coated on both sides in standard widths.

(390) A subscriber has heard of a press which opens and closes by electric power, and desires address of the manufacturer.

(391) Inquirer wishes to get in touch with manufacturers of equipment for making arctics, snowshoes, etc.

(392) We are asked for addresses of manufacturers of burrs for rubber heels.

(393) A subscriber wishes to get in touch with manufacturers of whistles for use in balls.

(394) List of manufacturers of printers' and lithographers' blankets in the United States is requested.

(395) Information is requested regarding supply sources of cyclo-hexane.

(396) We are asked for a list of rubber manufacturers who could supply accelerator pads, of non-blooming, inexpensive black stock.

(397) Source of supply of calendered sheeting is requested.

(398) From London comes a request for names of manufacturers of "Elephant Hide" proofed cloth.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Requests for each address should be on a separate sheet and state number.

Number	Country and Commodity	Purchase or agency
9634	Java—Rubber estate machinery, filter presses, vacuum apparatus, steam pumps and centrifugal machines	Agency
9642	Ireland—Rubber stamp manufacturing machinery; also materials for the purpose, and accessories	Purchase
9648	Italy—Tires	Purchase and agency
9706	Czechoslovakia—galoshes for winter of 1924-25	Purchase
9707	Canary Islands—Tires and tubes	Agency
9722	Italy—Tires	Purchase and agency
9767	Czechoslovakia—Balloons and other toys	Agency
9768	South Africa—Belts, being wearing apparel	Purchase
9793	Venezuela—Balloons with decorations	Purchase
9877	India—Tires	Agency
9889	Denmark—Vulcanized rubber in sheets	Purchase
9890	Germany—Cord tires	Purchase
9891	Czechoslovakia—Toys, including dolls, animal figures, balls and diabolos	Agency
9893	Rumania—Rubber goods of all kinds	Agency
9909	India—Toy balloons	Purchase
9917	Brazil—Rubberized material for automobiles	Agency
9924	Poland—Tires	Agency
9955	Mexico—Druggists' sundries, including water bags, gloves, nipples, aprons, tubes, and sheets	Agency

Foreign Tariffs

The Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C., has recently issued the following special circulars regarding foreign customs tariffs:

Circular No.	Country	Articles
425	Union of South Africa	Rubber Hose Dumping Duty, Proclamation
*429	India	Rubber Goods
432	Peru	Rubber Goods
**435	Salvador	Rubber Goods
†439	Guatemala	Rubber Goods
††445	France	Rubber Goods

*Canceling Special Circular No. 200.
**Canceling Special Circular No. 279.
†Canceling Special Circular No. 232.
††Canceling Special Circular No. 35.

Three Generations of Rubber Men

The name of Hood was prominent in the annals of the American rubber industry while Charles Goodyear was still developing the process of vulcanizing rubber, and it has always been among the industrial leaders of Greater Boston, Massachusetts.

George H. Hood

The late George H. Hood was one of the pioneers in the manufacture of rubber goods in America, and for nearly forty years he was a leader in his line. He was born in 1835 and died in 1913. He became engaged in the rubber industry just as he was reaching his majority.

Mr. Hood entered business independently soon after the close of the Civil War. In 1872 he joined the late Robert D. Evans in the formation of the Eagle Rubber Co., Jamaica Plain, Massachusetts, and served in the capacity of general manager. Three years later they formed the American Rubber Co., as a distributing agency for their products, and also for handling footwear manufactured by the Meyer Rubber Co., of New Brunswick, New Jersey. In 1877 the American Rubber Co. engaged in the manufacture of footwear and clothing in a large plant in Cambridge, Massachusetts.

Mr. Hood left the Eagle Rubber Co. in 1878, at which time he founded the Boston Rubber Co., of Chelsea, Massachusetts, where he manufactured wringer rolls, molded goods, rubber surfaced cloths and rubber clothing. Ten years later he also bought a factory at Franklin, Massachusetts, and began the manufacture of the widely known "Bell" brand footwear. In 1892, when the United States Rubber Co. was formed, Mr. Hood sold out his interests to and was a director of that concern for four years, retiring from active business in 1896.

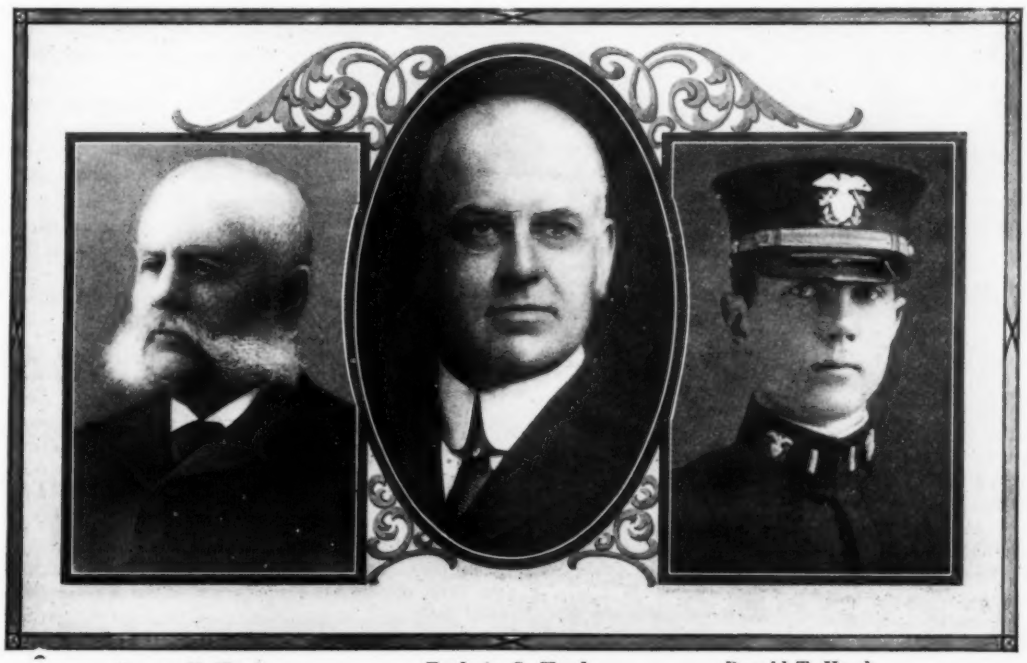
It is interesting to know that Mr. Hood was one of the organizers of the Rubber Mutual Insurance Co., served as director of the Old National Hamilton Bank of Boston, and also as director of several important traction, light and power companies.

Frederic C. Hood

Frederic C. Hood is the son of George H. Hood and was born in Chelsea, Massachusetts, in 1865. He received his education in local schools and was graduated from Harvard University, Class of 1886, of which class he has been the chairman for many years.

Immediately after his graduation from Harvard, Mr. Hood entered the rubber business with his father's company, the Boston Rubber Co., became secretary in 1888, and later assistant treasurer and superintendent.

In 1896, after the Boston Rubber Co. was permanently discontinued by the United States Rubber Co., Mr. Hood, with his brother Arthur and others, organized the present Hood Rubber Co., at Watertown, Massachusetts. Mr. Hood is now president and treasurer.



George H. Hood Frederic C. Hood Donald T. Hood

The business of the Hood Rubber Co. has grown steadily and its factory makes more rubber boots and shoes than any other factory in the world. In addition to its footwear business, the company holds a prominent position as a manufacturer of pneumatic tires and tubes, solid rubber tires, rubber heels and soles, and hard rubber products.

The success of the Hood Rubber Co. is due to its progressive business and technical management. For over twenty years it has had chemical and physical laboratories second to none, and for twenty-five years has had hospitals, doctors and nurses for rendering medical service to its employes, and has been a pioneer in the establishment of plans to assist employes in the prevention of sickness. This Service Department has charge of the scores of details which are included in the employment relation, such as safety and sanitation, sickness benefits, health, Americanization, hospitals, doctors, dentists, oculists, nurses, all with a view to prevention of sickness, and the selection of occupations, so that

the employe can have the opportunity for regular attendance and for earning the maximum yearly wage.

Mr. Hood has always been interested in organizations and associations that contribute to the good of industry in general and the rubber business in particular. He held various offices with the New England Rubber Club, the predecessor of the Rubber Association of America, of which latter association he was president in 1911 and 1912, and is now a director *ex officio*. He was also appointed the Rubber Association representative on the National Industrial Conference Board, serving as its treasurer for three years.

Mr. Hood has devoted much attention to the Associated Industries of Massachusetts, and was its president for the two years of 1918 and 1919, and is now a director *ex officio*.

His contribution to the World War consisted, among other things, in his work in connection with the Liberty Loan Drives, Red Cross drives and other allied activities, representing the rubber industry in each of these matters. In addition to his activities along this line he served on the National War Labor Board and was treasurer for the Home Service for American Soldiers Abroad.

Mr. Hood has always been actively interested in sports and was captain of the Harvard University la-crosse team. At the present time his two hobbies are golf and dogs. He plays golf, serves on committees, and has even built a golf course. Mr. Hood's kennels are known as "Boxwood Kennels," and Boxwood dogs have won hundreds of prizes, the most notable win being that by "Boxwood Barkentine" as best of all breeds in the Westminster Show at Madison Square Garden in 1921.

Donald T. Hood

Donald T. Hood, son of Frederic C. Hood, was born in 1893. He was educated in private schools, finishing at Harvard University in 1914. Like his father, he is very much interested in sports of all kinds, having served as manager of the 'Varsity baseball team in his senior year.

Upon his graduation from Harvard University he entered the employ of the Hood Rubber Co. and has served in many capacities, both in the manufacturing and selling departments. At the outbreak of the World War he was manager of the Hood Tire Co. in Los Angeles, California. He enlisted in the service and was assigned to the Naval Aviation Division, serving as superintendent of construction of aircraft at Akron, Ohio, with the rank of lieutenant.

Immediately after the close of the war, Mr. Hood reentered the employ of the Hood Rubber Co. He is now assistant treasurer, clerk of the corporation, and a director.

ATTEMPTS TO REGULATE VOLUME OF AUTOMOBILE TRAFFIC

Statistics quoted by George M. Graham, chairman of the Traffic Planning and Safety Committee of the National Automobile Chamber of Commerce, show that last year for the first time in the history of the automobile industry the total production of cars and trucks exceeded 4,000,000, a gain of 50 per cent as compared with 1922, the previous record year. These cars and trucks represented a wholesale value of $2,500,000,000, while parts, tires and accessories totaled $2,000,000,000 more.

Attempts to regulate this great and steadily increasing volume of traffic constitute a most serious problem. While standardization of traffic regulations is admittedly one of the greatest needs, it is also conceded to be most difficult of accomplishment. Under proper regulation, however, many deaths at present occurring through automobile accidents are preventable, as statistics show. Because of superior methods applied by Massachusetts, fatalities in that state were reduced from 532 in 1919 to 500 in 1922, whereas in New York during the same period they grew from 1,361 to 1,725.

Paper Industries Exposition

The Second Annual Exposition of the Paper Industries was held at Grand Central Palace, New York, N. Y., April 7-12, 1924, in connection with the Annual Convention of Paper Manufacturers.

There were nearly 100 exhibits comprising important machinery, special equipment, and materials, required in modern paper making, as well as many new and interesting varieties of paper and paper products.

Figures compiled by the American Paper and Pulp Association indicate that the total production of paper of all grades in the United States in 1923 was approximately 7,200,000 tons. Rubber goods play an important part auxiliary to paper making in the way of deckles, rolls, hose, belting, gaskets, and special applications. Paper and pulp mills offer an attractive field for the mechanical rubber goods manufacturer equipped to meet exacting service conditions with high quality products.

The following named companies are specially noted for the relation of their products to both rubber and paper manufacture.

AMERICAN SCHAEFFER & BUDENBERG CORPORATION, BROOKLYN, NEW YORK. Pressure gages and recording thermometers. The time punch on the Columbia recording thermometer is a feature of special value because it eliminates spoilage and losses through careless inattention to the maintenance of uniform temperatures.

CAMERON MACHINE CO., BROOKLYN, NEW YORK. This company made a very interesting display of "Camachines" for slitting and roll-winding paper and other products. The machines were demonstrated in action on paper and the rolled product was distributed as samples. A special feature of this exhibit was a machine sufficiently large to cut rolls 114 inches in length. The company has listed 1,000 applications of Cameron machines in producing slit and rolled material of various sorts.

THE B. F. GOODRICH CO., AKRON, OHIO. This exhibit featured rubber covered squeeze rolls for paper machines; "1788" belting for power transmission in paper mills and other heavy service, and "Cutless" rubber bearings and sealing rings. As an example of serviceability, a Goodrich rubber covered squeeze roll was shown, taken from a paper machine after nine months' service. In that time it had pressed over 13,000,000 pounds of paper without sign of corrugation or requiring regrinding. It was removed solely for exhibiting its perfect condition and will be returned to service after the show.

NATIONAL ANILINE & CHEMICAL CO., NEW YORK, N. Y. Of the great variety of chemicals and colors made by this company only those were shown that relate to paper making and coloring. The dyes shown were exhibited in a great color variety on paper.

SMITH & SERRELL, NEWARK, NEW JERSEY. This company featured their flexible coupling for shafting which is meeting general approval of paper, rubber and other industrial engineers.

VOORHEES RUBBER CO., JERSEY CITY, NEW JERSEY. The small compact exhibit of this company effectively substantiated the claims made for their "Sensation" lines of belting, steam, water and air hose designed and built to meet hard service conditions. The reason is balanced construction and highest grade materials combined in correct design of the goods. In these goods friction tube and cover quality is the same pure rubber without reclaims or fillers.

Another high class specialty shown by the Voorhees company is the rub-steel reinforced valves for heavy pumping duty.

C. K. WILLIAMS & CO., EASTON, PENNSYLVANIA. These manufacturers of fillers and oxides for the paper, paint and rubber trades, exhibited an interesting display of asbestine, clay, yellow ocher, oxide of iron and other compounding ingredients.

"PNEUMATIC TIRES," BY HENRY C. PEARSON. AN ENCYCLOPEDIA of tire manufacture, repair, rebuilding, machinery and process.

News of the American Rubber Trade

Current Outlook in the Rubber Industry

THE business uncertainty prevailing a month ago still continues, due in part to reaction from failure of a spring boom to materialize according to general expectation.

Severely competitive conditions and the uncertainty of pending federal legislation have led to drastic action on the part of company executives for conservation of resources to meet future contingencies.

Rubber manufacturers are following the policy of purchasing only for current needs. Stocks are small and orders frequently repeated. Tires are excessively competitive at present prices and although they represent the largest volume of the rubber industry all other lines of rubber goods average a greater aggregate of profit as shown in reports of last year's business.

Cotton for tire building and also crude rubber have ruled consistently low for several months. There was an overproduction of tire fabric which dropped its price to figures unwarranted by the raw cotton situation.

Crude rubber has declined slowly in price for nearly four months because of cautious buying by consumers for current needs only. Tire manufacturers able to take advantage of present prices for basic materials can probably make a fair profit on their output at the prevailing scale of low prices.

The high rate of automobile production for the first quarter of this year has recently been considerably reduced. This has reduced original equipment, tire output schedules, topping, etc., to avoid overproduction. Current monthly tire production in the Akron district is estimated at 4,000,000. The desire of tire dealers to secure stocks of balloon tires in anticipation of their expected popularity has caused dealers to minimize their stock of high pressure tires. Tire manufacturing interest centers around balloon tire design and production. All companies able to finance the large expense involved for the new equipment needed are securing it as rapidly as it can be built.

Financial

United States Rubber Co. Strong Financially

C. B. Seger, chairman of the board of directors of the United States Rubber Co., made the following statement at the annual meeting of the stockholders, held at New Brunswick, New Jersey, April 15, 1924.

It should be borne in mind that the United States Rubber Co. is not exclusively a tire company, but that it does a general rubber goods business, including a full line of mechanical goods, hose, belting, waterproof and canvas footwear, clothing, insulated wire, elastic thread, druggists' sundries, and in fact, practically everything that is made of rubber, the volume in tires and tubes constituting less than one-third of the total. Furthermore, the company conducts a very large merchandising business through a chain of fifty branch stores in this country alone, located at all important business centers.

The company closed the year in a strong financial condition, as evidenced by the fact that the accounts and notes receivable from customers, amounting to approximately $44,000,000 after deducting adequate reserves for doubtful accounts, were nearly $6,000,000 in excess of the total bank loans amounting to $38,235,000. With cash approximately equal to the accounts payable and acceptances, this leaves entirely free from current debt the inventories of finished goods and raw materials amounting to about $67,500,000. The inventories were conservative as to quantities and sound as to values, all obsolete items having been written off, the only possible exception being goods at foreign branches, the value of which depends upon conditions in the foreign markets.

The accounts receivable, amounting to approximately $44,000,000, represent open accounts with more than 100,000 merchants and corporations, including railroads, mines, mills and practically every form of industry, as well as jobbers and retailers.

Substantially all of the profits for the year 1923 were derived from approximately two-thirds of the total sales, comprising mechanical goods, hose, belting, footwear, clothing, etc., the results from the remaining one-third, principally tires and export business, being unsatisfactory. In other words, about two-thirds of the total sales of $186,000,000 produced sufficient net profit to provide for all fixed and other charges, including depreciation of plants, and for the payment of the preferred dividend, leaving a balance of about $1,800,000 for surplus. Hence, the problem of future earning power is confined to the tire business, and the hope that results from tire sales during 1924 will show substantial improvement has been fully justified by the fact that it was proportionately realized in the first three months of the year, and the outlook for a continuance of this improvement is encouraging. The results from sales of all other commodities during the first quarter of 1924 were satisfactory, with the result that the quarterly dividend on the preferred stock was earned within the quarter, with a fair margin of safety after all charges, including full charge for depreciation of plants. Sales for the first quarter of the year are always relatively light, due to the seasonal nature of the business.

The following directors were elected at the annual meeting:

James S. Alexander, New York, N. Y.; Walter S. Ballou, Providence, R. I.; Nicholas F. Brady, New York, N. Y.; Matthew C. Brush, New York, N. Y.; Middleton S. Burrill, New York, N. Y.; Newcomb Carlton, New York, N. Y.; John W. Davis, New York, N. Y.; James Deshler, New Brunswick, N. J.; James B. Ford, New York, N. Y.; Sir Charles B. Gordon, Montreal, Canada; Francis L. Hine, New York, N. Y.; Ernest Hopkinson, New York, N. Y.; Henry L. Hotchkiss, New Haven, Conn.; Lester Leland, Boston, Mass; Samuel M. Nicholson, Providence, R. I.; Homer E. Sawyer, New York, N. Y.; Charles B. Seger, New York, N. Y.

Goodrich Reelects Directors and Officers

At the annual meeting of the stockholders of The B. F. Goodrich Co., held April 16, 1924, all directors whose terms of office expired were reelected. The stockholders also voted to reduce the authorized but unissued common stock by 750,000 shares and to retire 11,880 shares of preferred stock in accordance with the charter provisions.

At the regular directors' meeting which followed, officers were reelected without change. The regular quarterly dividend on the preferred stock of $1.75 per share was declared, payable July 1, 1924, to stockholders of record June 21, 1924.

President Work stated that while it has never been the policy of the company nor of the present management to look into the future and prophesy results, it seems advisable, in the interests of the stockholders, to depart from this general rule at this particular time.

As everybody knows, the rubber industry as a whole has been passing through a period of depression during the past few years, and our company suffered with the rest.

The turn of the year brought a substantial improvement to the industry, and judging by the results of the first three months' operations of our company, the management ventures to predict that we may look forward to the future with confidence.

The estimated earnings for the first quarter were considerably in excess of bond interest and preferred dividend requirements.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Firestone Tire & Rubber Co.....	Com.	$1q.	Apr. 21	Apr. 10
Goodrich, B. F., Co.....	Pfd.	$1.75q.	July 1	June 21
Hood Rubber Co.....	Pfd.	$1.75q.	May 1	Apr. 21
India Tire & Rubber Co.....	Com.	1%	.....	Mar. 20
India Tire & Rubber Co.....	Pfd.	1¼%	.....	Mar. 20
Overman Cushion Tire Co.....	Com.	1½%q.	Apr. 20	Mar. 31
Overman Cushion Tire Co.....	Pfd.	1½%q.	Apr. 20	Mar. 31
United States Rubber Co.....	1st Pfd.	2%q.	Apr. 30	Apr. 15

New York Stock Exchange Quotations

April 23, 1924

	High	Low	Last
Fisk Rubber, com.	6⅜	6⅜	6⅜
Goodrich, B. F., Co., com.	21	20⅛	21
Goodrich, B. F., Co., pfd. (7)	71¾	71¾	71¾
Goodyear Tire & Rubber, pfd.	42	42	42
Goodyear Tire & Rubber, pr. pfd. (8)	92	90½	91½
Kelly-Springfield Tire, com.	15¾	14¼	15⅜
Kelly-Springfield Tire, pfd.	49	48	49
Kelly-Springfield Tire, pfd. (6)	52½	52½	52½
Lee Rubber & Tire, com.	10½	10⅛	10⅛
United States Rubber, com.	28⅛	27¼	28⅛
United States Rubber, 1st pfd. (8)	77½	74½	76¾

Akron Rubber Stock Quotations

Quotations of April 23 supplied by App-Hillman Co., Akron, Ohio:

	Last Sale	Bid	Asked
American com.	5	...	10
American pfd.	50	...	35
Amazon com.	1¾	1½	2¼
Firestone com.	66	...	68
Firestone 6% pfd.	94	93½	94
Firestone 7% pfd.	86	86	87
General com.	165	163½	185
General 7% pfd.	100	98¾	100
Goodrich 6½s	95¼	95	95½
Goodyear com.	9¾	9⅜	10
Goodyear 7% pfd.	42	41¾	42½
Goodyear 1st mtg. 8s	115½	115½	115½
Goodyear deb. 8s	102	101½	102
India com.	81	76	80
India 7% pfd.	80	75	82
Mason com.	1	¾	1½
Mason 7% pfd.	16	15	17
Miller com.	63½	63	65
Miller 8% pfd.	97	96½	97¼
Mohawk com.	6	6	9
Mohawk 7% pfd.	50	50	53
Rubber Products	10	10	...
Seiberling com.	4	3¾	4¼
Seiberling 8% pfd.	40	38	...
Star com.	9	...	15
Star 8% pfd.	30	...	60

New Incorporations

Archer Collapsible Rim Co., The, March 20 (Delaware), $150,000, par value $10.00. Incorporators: Carmelo Mobilia, Louis Mango, J. V. Moliv, Nick Verarduinelli, Pasquale Bruno, Frank Archer, and Antonino Sampieri, all of Erie, Pennsylvania. Principal office, with the United States Corporation Co., 19-21 Dover Green, Dover, Delaware. To manufacture and sell collapsible rims.

Burton-Wade Rubber Co., February 8 (California), $20,000, par value $100.00. Incorporators: E. W. Hendrick, Bart F. Wade, and Franklin F. Adams. Principal office, Vernon, California. To manufacture rubber products.

Dural Rubber Corporation, January 19 (New Jersey), $72,000. W. C. Ehrenfeld, president and general manager; Robert Chris, secretary and treasurer, both of Flemington, New Jersey. Principal office, Maple avenue, Flemington, New Jersey. To manufacture rubber tires and tubes for aircraft, automobiles and other vehicles and to manufacture and generally deal in rubber goods of every kind.

Hathaway Tire Co., February 9 (Michigan), $8,000. F. A. Hathaway, president and assistant secretary. Principal office, 108 N. Westnedge avenue, Kalamazoo, Michigan. To sell Goodyear tires, tubes and accessories, together with automobile accessories.

Hi-Milage Cushion Tire Co., Inc., March 6 (New York), $10,000. Incorporators: Otto Bang, 519 Jackson avenue, New York City; Samuel Devane, 1730 Bath avenue, Brooklyn; and Charles B. Perkins, 540 West 165th street, New York City. Principal office, Manhattan. To manufacture tires for automobiles, carriages, etc.

Imperial Rubber Corporation, The, March 25 (Delaware), $150,000, par value $100. Incorporators: M. M. Lucey, M. B. Reese, and L. S. Dorsey, all of Wilmington, Delaware. Principal office, with the Colonial Charter Company, 927 Market street, Wilmington, Delaware. To carry on a business of crude and manufactured rubber, and to plant, grow and cultivate rubber trees.

Kunken Rubber Works, Inc., March 25 (New York), $5,000. Incorporators: Ezra Gottlieb, Jacob L. Diamond, and Louis Brown, all of 305 Broadway, New York City. Principal office, Manhattan. To carry on a general automobile tire and accessory business.

Lundi Tire & Rubber Co., Inc., April 9 (New York), $20,000. Incorporators: Robert E. Lundi, 105 West 63rd street, William Jude, and Edward J. Gould, 51 Chambers street, all of New York City. Principal office, Manhattan. To manufacture rubber tires.

Mida Tire Corporation, April 8 (New York), $10,000. Incorporators: Leo Geinberg, 447 East 164th street; Mark Schreck, 366 W. 45th street, and George Schreck, 366 W. 46th street, all of New York City. Principal office, Manhattan. To deal in tires, radio accessories, etc.

Motive Parts Corporation, of New Jersey, The, March 29 (New Jersey), $25,000, divided into 250 shares of par value of $100.00 each. Incorporators: Stella Setel, 178 Court street; Caroline Preuss, 768 Bergen street; Charles Bobker, 195 Ridgewood avenue, all of Newark, N. J. Principal office, 738 Broad street, Newark, N. J. To deal in appliances and accessories for automobiles.

Reinforced Rubber Flooring Corporation, March 24 (New York), 1,000 shares pending further development of its plans. Walter R. Stone, president; Sanford Skinner, vice-president; J. B. Losey, treasurer, and Raymond D. Caldwell, secretary, all of Syracuse, New York. Principal office, Syracuse, New York. To manufacture reinforced rubber flooring.

Replacement Parts, Inc., March 18 (New Jersey), $10,000, divided into 400 shares without nominal or par value. Incorporators: Charles Vrooman, Avon, New Jersey; LeRoy B. Tuttle; Florence L. Tuttle, both of Asbury Park, New Jersey. Principal office, 1200 Main street, Bradley Beach, New Jersey. To carry on a business in supplying parts and accessories for automobiles.

Rid-Ged Grip Co., The, January 2 (Ohio), $25,000. W. F. Ridge, president and treasurer; L. T. Barnette, vice-president and general manager, and Clarice Cook, secretary, all of Akron, Ohio. Principal office, 227 West Thornton street, Akron, Ohio. To manufacture Rid-Ged Grip steering wheel tires.

Rubber-On-Metal Welding Corporation, April 3 (New Jersey), $100,000. Incorporators: John R. Turner, Basking Ridge, New Jersey; Charles J. Skinner, 9 Rutgers Place, Jersey City, New Jersey, and Alfred J. McCabe, 3 Britton street, Brooklyn, New York. Principal office, 15 Exchange Place, Jersey City, New Jersey. To deal in devices and formulas for the manufacture of rubber and metal goods.

Traylance Pen Co., March 8 (New York), $24,000. Joseph M. Gilliam, president; Ludwig Loeser, vice-president; Sanford Erlanger, treasurer; N. W. Schefferman, secretary and general manager. Principal office, 130 West 42nd street, New York City. To manufacture combination fountain pens and pencils.

Uniflex Rubber Co., The, March 27 (New Jersey), $125,000, divided in 1,250 shares, par value $100.00. Incorporators: Henry Lemmermann; Herman F. Lemmermann, both of 145 Sterling avenue, Yonkers, New York, and Louis G. Davenport, 279 Little street, Belleville, New Jersey. Principal office, 40 Paterson avenue, East Rutherford, New Jersey. To manufacture and sell molded rubber goods and plumbers' rubber supplies.

The Rubber Trade in the East and South

Manufactured Goods

Rubber goods manufacturing is marked by seasonal activity on products for summer use, such as garden hose, fruit jar rings, etc. Insulated wire and cable factories are producing at high rate. This line is becoming notably competitive, due to the increase in numbers of wire insulation companies.

Rubber footwear factories are mostly operating but four days a week, the result of two winters of less than normal demand. In heels production is fair in amount with close competition in prices and grades. The popularity of crêpe soles for sport shoes is very well established and production active. There is a strong tendency to supplant the original uncured crêpe sole with the vulcanized crêpe sole made possible by the use of ultra-accelerators.

Presumably there is a gain in wearing quality. Interest in rubber flooring is increasing. This line is becoming competitive as additional rubber mills take it up.

Mechanical specialties, belting, sundries and weather proofed clothing are all in active production. The same is true of hard rubber products for radio purposes.

Tire business is disappointing and much complicated by the difficulties attending the introduction of balloon and balloon type tires. Manufacturers of tire building appliances are crowding their facilities to produce balloon tire making equipment to meet the demand for the change from high to low pressure tires. Absence of agreement among tire manufacturers has led to a multiplicity of tire sizes and increased equipment expense. The April schedule of the large producers of tires is curtailed from a quarter to a third below seasonal expectations.

Manufacturers of rubberized topping are under instructions from automobile manufacturers to delay somewhat deliveries of their output on order.

U. S. Rubber Executives

At the organization meeting of the board of directors of the United States Rubber Co. held April 17, 1924, the following elections and appointments were made for the ensuing year:

EXECUTIVE COMMITTEE: Charles B. Seger (chairman), Lester Leland, James S. Alexander, Walter S. Ballou, Nicholas F. Brady, James B. Ford.

OFFICERS: Charles B. Seger, chairman of the board of directors; Lester Leland, vice-chairman of the board of directors; Charles B. Seger, president; James B. Ford, Homer E. Sawyer, Ernest Hopkinson, H. Stuart Hotchkiss, and Edward H. Hart, vice-presidents; Charles J. Butler, Edward J. Coughlin, George H. Mayo, George S. Shugart, and Raymond S. Willis, second vice-presidents; Samuel Norris, secretary; Wilson H. Blackwell, treasurer; William

O. Cutter, comptroller; John D. Carberry, assistant secretary and assistant treasurer; Sherwood S. Green and H. H. Nance, assistant treasurers; Henry B. Hubbard, financial manager of sales; William H. Marsh, general purchasing agent; George F. Hichborn, general traffic manager; Harold B. Grouse, Earl D. Page, M. George Burnett, and Noble Ashley, assistant comptrollers; George E. Smith, auditor; Samuel Norris, general attorney; Kennedy M. Thompson, attorney; Eric C. Burkman, assistant to the president; John Bensinger, transfer clerk; F. V. Glynn, secretary to the chairman and president; John W. Davis, general counsel; R. V. Lindabury, New Jersey counsel; W. G. Parsons, and George E. Smith, special vice-presidents.

New York

The following were recently elected directors of the Lee Rubber & Tire Corporation, which maintains executive offices at 33 West 60th street, New York, N. Y.: C. H. Booth, formerly receiver and president of the Republic Rubber Co.; F. M. Small, also president of the Martin-Perry Corporation; and William B. Dunlap, assistant treasurer of the Lee organization.

F. R. Henderson & Co., Inc., importer of crude rubber, rubber latex and general produce, has moved to the Fisk Building, 250 West 57th street, New York, N. Y. In the new home of this company light and commodious offices are provided for the firm members, and also for the sole crêpe, rubber latex, and general produce departments. This is another important and well known firm to establish headquarters in the uptown rubber center.

On April 18 the executive offices of the General Carbonic Co. were removed to 17 West 46th street, New York, N. Y.

John B. Tuttle, consulting chemist and rubber technologist, announces a change of address to 75 Bedford street, New York, N. Y.

A removal from 239 Front street to 251-255 Front street, New York, N. Y., is announced by the L. H. Butcher Co., Inc., specializing in colors and chemicals for the rubber trade. The change to new quarters, necessitated by the growth of the company's business, will give the plant three times its former storage capacity, while the shipping facilities will also be greatly improved. V. G. Thomas is general manager.

R. G. Wine, formerly acting branch manager at the Minneapolis branch of the Firestone Tire & Rubber Co., Akron, Ohio, has been recently appointed national account representative at the company's New York City branch.

At the recent annual meeting of the stockholders of the Kelly-Springfield Tire Co., 250 West 57th street, New York, N. Y., C. P. Stewart-Sutherland, secretary of the organization, was made a member of the board of directors, while the following officers were reelected: A. L. Scheur, president; F. A. Seaman, first vice-president; C. A. Brown, Maurice Switzer, J. V. Mowe, and T. C. Marshall, vice-presidents; C. P. Stewart-Sutherland, secretary; H. B. Delapierre, treasurer; and M. C. Lachenbruch, auditor.

At a meeting on April 10 of the executive committee of the United States Rubber Co., 1790 Broadway, New York, N. Y., the resignation of Frank A. Vanderlip as a director of the organization was accepted.

On April 25 the New York City offices of The American Zinc, Lead & Smelting Co. and its subsidiary, The American Zinc Sales Co., were removed to the Prudence Building, 331 Madison avenue, at 43rd street.

J. P. Fleming, formerly with the Tidewater Chemical Co., is now manager of the rubber department of Scott L. Libby Corporation, 18 Old Slip, New York, N. Y.

The Rome Wire Co., Rome, New York, having recently sold its plant formerly maintained at Stamford, Connecticut, as the Atlantic Insulated Wire & Cable Co., is preparing to house the equipment of the last-mentioned organization at its Rome plant. For this purpose a large addition will be erected, while the same grade of wire as formerly manufactured at Stamford will be produced. The executive personnel and sales forces of the Atlantic Insulated Wire & Cable Co. will also remain unchanged.

The Garlock Packing Co., Palmyra, New York, specializing in the manufacture of packings made of rubber, and fibrous and metal materials, has recently enlarged its plant by the erection of a large storage warehouse, measuring 100 by 200 feet, and of concrete and brick construction.

S. H. Smith, at one time superintendent of the Empire Tire & Rubber Co., is now acting in a similar capacity for the Beacon Tire & Rubber Co., Beacon, New York.

Eastern and Southern Notes

At a special meeting of the board of directors, held on April 21, 1924, George W. Daum was unanimously elected vice-president and general manager of the Pennsylvania Rubber Co., succeeding the late Seneca G. Lewis. Mr. Daum has been with the Pennsylvania Rubber Co. since November, 1909, coming from The B. F. Goodrich Rubber Co. He has held successive positions of cost manager, assistant superintendent, superintendent, production manager and vice-president and assistant general manager. He has been so closely associated with the constructive policies of the company for so many years that he is excellently qualified to direct its affairs.

The Pennsylvania Rubber Company of America, Inc., announces the appointment of C. B. Williamson as manager of their New York branch, succeeding D. D. F. Yard, resigned. Mr. Williamson was engaged in sales promotional work in the New York district for two years and he has been manager of the Pittsburgh Branch for the past four years.

Enlargements of the Sharon, Pennsylvania, plant of the Westinghouse Electric & Manufacturing Co. will provide an additional floor space of about six acres to the company's present works which cover approximately seven acres. Another important extension will be the enlargement of the company's Homewood plant, where three new factory units are also now under construction. These units, containing approximately 120,000 square feet of floor space, will bring the total floor area of the plant to 200,000 square feet.

The following executives were recently elected at a stockholders' meeting of the Connecticut Mills Co., tire fabric manufacturing organization at Danielson, Connecticut: Obadiah Butler, president; Harry L. Burrage, vice-president and secretary; Roland H. Ballou, vice-president and manager of sales; and Victor T. Anderson, treasurer.

The Blackwood Tire Co., 912-20 Broadway, Nashville, Tennessee, dealer in tires, batteries, etc., has recently completed a new station at First and Woodland streets, Nashville, this representing the fifth station to be constructed by the company in various sections of the city. The five buildings, planned to give satisfactory service to the customer, contain approximately 44,750 square feet. H. O. Blackwood is president and general manager.

Southern offices at the Vivian Spinning Co., Cherryville, North Carolina, have been recently opened by Barnwell & Co., 313 Ohio Building, Akron, Ohio. John J. George is in charge of the new branch.

About May 1 the newly-organized Southern Webbing Mills, Inc., will begin operations at its recently-constructed plant in Greensboro, North Carolina. Products will include narrow elastic webbing, to be used in making garters, suspenders, and similar articles. The executives of the new organization are: F. Dudley Courtenay, president and treasurer; L. W. Joyce, vice-president and secretary; and Thomas S. Dalton, vice-president. The superintendent will be Warren Cooke, formerly connected with the textile experimental laboratory of the United States Rubber Co.

The Rubber Trade in New Jersey

Manufactured Goods

Trenton rubber manufacturers continue to be busy and the only complaint is that there is not enough profit in cord tires. Manufacturers would like to see prices advance soon and give a little more profit. The majority of the Trenton tire manufacturers are now making balloon casings, there being but one or two who have not as yet ventured into this field. Competition will eventually compel all the concerns to turn out the low pressure tires.

Two more local plants added balloon tires to their output recently. With the approach of summer there has been a larger demand for various kinds of mechanical goods. Garden hose and belting lead the list in production at most of the plants. The demand for rubber heels and soles holds up well and the manufacturers see no let up. The activity in hard rubber goods is principally due to the radio popularity and manufacturers are adding new departments for the special parts.

The Carolyn Stokes Memorial

The Carolyn Stokes Day Nursery, erected at Trenton, New Jersey, by William J. B. Stokes, prominent rubber manufacturer, in memory of his daughter, Mrs. Carolyn Stokes Blanchard, who died during the influenza epidemic a few years ago, is greatly appreciated by residents of that city. Situated at 104 Taylor street, the building is a pretty structure with bright sunny rooms and comfortable furnishings. Here, under the supervision of a competent nurse and attendants, children of East Trenton may receive proper care while their mothers are at work.

Probably the most popular room of the nursery is the play room, which has been furnished and is being maintained by Robert J. Stokes, brother of the late Mrs. Blanchard. Mrs. Robert S. Johnson, mother of Mrs. William J. B. Stokes, has furnished the babies' room. Architect J. Osborne Hunt gave his service free

The Carolyn Stokes Day Nursery

in planning the building, while W. J. B. Stokes paid for the construction, which amounted to more than $25,000.

Dedicated to children, the nursery is under the supervision of the Contemporary Club, of Trenton, the organization that first started settlement house work in East Trenton. Mr. Stokes, who was interested in the settlement work in that section of the city, decided to erect a substantial nursery for the poor children.

Enlarging the scope of usefulness beyond the immediate care of children during the day, prenatal and pre-school-age clinics are held each week, carrying out the wish of Mrs. Stokes, who is deeply interested in this work, and who has had a room at the nursery built especially for this purpose. The clinic is conducted by the city of Trenton with a physician and nurse in charge. A baby clinic is also conducted there each Tuesday by the city.

Mr. Stokes is particularly anxious to have the building used as a community center, where the older boys and girls may meet regularly, forming clubs and planning different activities. Later a branch city library will be established in the building. Mrs. Stokes is honorary chairman of the social service committee of the Contemporary Club. Miss Hortense Zoeller has been appointed director of the nursery.

The following are the board of trustees of the institution: Mrs. W. J. B. Stokes; Mrs. F. B. Clark; Robert J. Stokes, secretary of the Thermoid Rubber Co.; J. Osborne Hunt; Archibald W. Brown; W. J. B. Stokes; Harry L. Boyer, general manager of the Joseph Stokes Rubber Co.; and Milton H. Martindell, cashier of the Home Rubber Co.

Trenton Notes

The Thermoid Rubber Co., recently decided to begin the manufacture of balloon tires on May 1. Price lists have been sent to all the agencies and the company expects a good demand for Thermoid Balloons. The company continues busy on garden hose and belting.

Federal Judge William N. Runyon at Newark, N. J., has issued an order continuing the receivership of the Bergougnan Rubber Co., Trenton, N. J., for thirty days. Charles E. Stokes, of the Home Rubber Co. and Gaston Tisne, treasurer of the Bergougnan Co., receivers, petitioned the court to be allowed to continue the receivership.

The John E. Thropp's Sons Company, Trenton, N. J., manufacturer of rubber machinery, has been awarded a judgment of $1,129.92 against the Atlantic Rubber Ace Co., New Brunswick, N. J., on a book account.

The Luzerne Rubber Co. has awarded a contract to the Karno-Smith Co. for an addition to the boiler house in East Trenton. The Puritan Rubber Co. will build an addition to be used as a press room. It will be a one-story brick structure and will contain special machinery.

The Globe Rubber Tire Manufacturing Co. has entered the balloon tire field and feels encouraged over the demand for the new casings. The company reports an increased output in cord tires.

The Essex Rubber Co. is optimistic over the future, and continues busy. Agencies and salesmen report better business as spring advances.

The Puritan Rubber Manufacturing Co., manufacturer of mechanical and molded goods, has increased working hours in order to cope with new business. The company is looking for a busy season during the warm months.

The Ajax Rubber Co. is operating 60 per cent normal and reports business as gradually increasing. The company reports that tire dealers' stocks throughout the country are running low.

The Spartan Rubber Co. continues to operate 24 hours a day and has begun the manufacture of balloon tires. The concern installed considerable new equipment for manufacturing the new casings.

The Firestone Tire & Rubber Co., Akron, Ohio, gave a sales force dinner at the Hotel Sterling, Trenton, N. J., after which J. M. Bushey, manager of the Philadelphia branch of the Firestone company, gave a talk illustrated by lantern slides, on the making, cost and operation of balloon tires. A number of automobile and tire dealers attended the meeting.

The Trenton Tire Dealers' Association will appoint a committee to investigate the report that tires are being sold to motorists by their friends employed in the manufacturing plants. At the last meeting the credit system was discussed at length and it was decided to eliminate all those who were bad pay. At a banquet

at Hillwood Inn, Frederick Petry, Jr., president of the association, was elected a member of the board of trustees of the Trenton Automobile Trade Association.

The Murray Rubber Co., which purchased in September, 1922, all the assets of the Empire Tire & Rubber Corporation, reports that sales during the year 1923 totaled over $6,000,000, while sales for 1924 are running at the rate of $8,000,000 for the year. All records for sales and production are said to have been broken during the past few months.

Sales of balloon tires especially in the 4.40/21 balloon tires for Ford cars have increased. In addition to 4 Murray balloon cords, the company offers 4 extra heavy red tubes, 4 21-inch wheels, 5 rims, tire carrier and wrench, which gives the Ford owner opportunity to enjoy balloon tire comfort. The company advocates the use of balloon tires on 20 and 21-inch wheels in preference to the semi-balloons, although competition has forced the building of both types.

Several of the large tire manufacturing companies have agreed to abolish signboard advertising along the highways, in compliance with the request of the National Committee for Restriction of Outdoor Advertising. The Ajax Rubber Company is the first Trenton concern to join the movement.

The Ajax, Hamilton, and Acme Rubber Manufacturing Companies displayed their various products at the Steel Pier Exhibition at Atlantic City during the past month.

New Jersey Notes

The Vulcanized Rubber Co., Morrisville, Pennsylvania, will erect a one-story brick building 44 by 132 feet. The structure will be the first of several units and will contain special machinery for making radio parts. The radio and other departments are very busy. The foremen of the various departments held a banquet at the Hotel Penn, Trenton, on April 3, when some of the officials were guests.

Ernest Hopkinson, vice-president of the United States Rubber Co., recently delivered a lecture before the engineering students at Princeton University, Princeton, N. J., in which he declared that the United States leads the world in the manufacture of rubber goods. The phenomenal growth of the industry was shown by comprehensive charts and by motion pictures of the company's Sumatra plantations.

H. M. Alexander, representing the Philadelphia district for the Lambertville (N. J.) Rubber Co., has been awarded the first prize of $50 offered by the concern for the largest sales of tennis shoes. W. T. Scott, of the Ohio territory, won the second award of $25, while D. W. Neish, of the New York district, won the third prize of $15.

On March 29 the plant of the Rubber Craft Corporation, Doylestown, Pennsylvania, was destroyed by fire, resulting in a loss of about $25,000. The concern was formerly the Tillinghast Rubber Co., located at Stockton, N. J. After this plant was burned the company reorganized and located in Doylestown. All orders are being turned out by another rubber company while the plant is rebuilding.

The Howe Rubber Corporation, New Brunswick, N. J., has opened a branch office and salesroom at 11 East Second street, Dayton, O. J. A. Smith has been placed in charge of the Dayton branch.

The S. & R. Tire Co. has moved to its new quarters, 1023 Main street, Asbury Park, N. J. The company is the Monmouth county distributer for the Diamond tires and tubes.

Plans for the reorganization of the Howe Rubber Co., New Brunswick, New Jersey, and the rehabilitation of the plant are in progress. This contradicts the rumor that the company was to go into a receivership. The principal creditors and the officers of the company have arranged an issue of $500,000 to place the company on a sound financial basis. The company has a large stock of goods on hand which will be greatly reduced before the plant is opened.

The Rubber Trade in Massachusetts

Manufactured Goods

Massachusetts rubber mills in most lines are fairly active on a conservative basis, general business conditions requiring caution, due largely to the highly competitive character of sales and the hand-to-mouth buying policy of dealers and large consumers.

Footwear plants are now operating four or five days a week, mostly on tennis lines for sport wear. Heels and soles are seasonally active at very small profit margins, crepe soles promising to increase greatly in popularity this summer. Owing to the mild winter, dealer's stocks of storm rubber footwear are reported fairly large considering their limited buying.

Tire output for spring dating business has been fair, although somewhat upset by uncertainty as to the probable demand for balloon and balloon type tires. Production of regular cords is now approaching summer volume. Interest in the new types appears to be developing slowly in New England.

Mechanical rubber goods are in satisfactory demand, and in seasonal lines good. Wire and cable orders indicate another active building season. Proofers are still busy with automobile topping, although car output is being reduced, and also with fabrics for waterproof garments, for which an active demand is developing for summer wear. The quiet season in druggists' sundries is now approaching.

Tire and Radio Stores

Seasonal declines in retail sales present one of the grave problems of the tire trade, as in many other lines of merchandising. Winter is the dull season in the retail tire business because fewer cars are driven then than in summer.

A side line such as automobile accessories, which many tire dealers also carry, helps to increase volume but is subject to the same seasonal objection. Obviously the logical thing is to take on a line of goods having a constant year-round demand, or at least one having an opposite seasonal decline. The former is difficult to find, but the latter is being found by many tire dealers in radio sets and parts.

Being an indoor sport, radio is most popular in winter, and atmospheric conditions are also more favorable during the cooler months of the year. It works out, therefore, that just about as tire demand slumps in the autumn radio demand picks up, and just as the latter in turn falls off in the spring the tire replacement business begins.

Boston tire dealers have not been slow to follow others elsewhere in utilizing radio to balance the seasonal sales character of their business. Among the prominent concerns now selling both tire and radio accessories may be mentioned the Boise Motor Equipment Co., Coward Auto Supply Co., Farley & McNeill, Hub Cycle & Auto Supply Co., Motor Parts Co., Palders, Inc., and Triangle Rubber & Supply Co. Storage battery and automobile ignition sales and service stores are also recognizing this merchandising principle extensively.

Boosting "Occasion" Footwear

Of importance to manufacturers of rubber-soled leather and canvas footwear is the movement in this state to boost as an official trade slogan, "The Right Shoe for the Occasion."

It is the opinion of manufacturers and retailers alike that the general and systematic use of this slogan will eventually create on the part of the public a sense of "shoe consciousness" that will be

permanently beneficial to the footwear industry, inasmuch as it will broaden the demand for its products.

Retailers are arranging in their show windows exhibits of "occasion" footwear, stressing men's shoes, which apparently need this particular stimulus more than does the department of feminine wear. Accompanying these displays are attractively printed cards reading somewhat as follows:

You should have
SHOES
for
FORMAL,
INFORMAL,
BUSINESS
and
SPORT WEAR
"The Right Shoe for the Occasion"

While the present Boston movement has been directly inspired by the manufacturers' organizations, the Massachusetts Retail Shoe Merchants' Association has taken the matter up enthusiastically. It is believed that if other cities will launch this idea energetically it will nationalize a business-promoting movement that is now more or less sporadic.

The output of footwear in the United States continues far below normal, and apparently other shoe manufacturing sections are not much better off in this respect than in New England.

Over-production in 1923 is one of the chief factors in the present dullness, and it already begins to look as though the 1924 output would be much less than the 351,000,000 pairs of last year. This should tend to stabilize conditions for the future.

Larger Offices for Haven & Hopkins

H. M. Haven & A. T. Hopkins, Inc., engineers and architects, have moved to larger and better quarters in the Lawyers' Building at 11 Beacon street, Boston, rooms 1121 to 1134 inclusive. Mr. Hopkins is treasurer of the Wilcox Comb Co., of Keene, New Hampshire, representing Boston interests. He reports a good year for 1923 and indications that 1924 will prove a better one. Mr. Hopkins is also interested in the Omo Manufacturing Co., of Middletown, Connecticut, and the Middlesex Rubber Co., of Reading, Massachusetts, as well as being treasurer of H. M. Haven & A. T. Hopkins, Inc.

This organization has financed several corporations this year, besides handling several important tax case appraisals, including that of the Amoskeag Manufacturing Co., at Manchester, New Hampshire. It has also designed the Turner Center dairy plant at Providence, Rhode Island, the Desurmont textile mill at Woonsocket, Rhode Island, and several schoolhouses near Boston.

Massachusetts Notes

Research in the use of rubber latex and its compounds is the object of the Rubber Latex Research Corporation, recently organized under Massachusetts laws and having its principal office in this city. The officers are W. Burton Westcott, president; Albert M. Davis, vice-president; Charles E. Valentine, treasurer. John W. Decrow, a well-known lawyer, is also one of the incorporators.

The Boston Shoe Style Show, otherwise the New England International Shoe and Leather Exposition and Style Show, is again announced for July 14 to 17 inclusive, in the Mechanics' Building. As in the past, rubber and canvas footwear, rubber and fiber heels and soles will be features of the show.

Trenton Tire & Supply, Inc., is the firm name under which a new automobile tire retail store is being conducted at 218 Columbus avenue.

Barnwell & Co., an organization specializing in cotton goods for manufacturers, and maintaining head offices at 313 Ohio Building, Akron, Ohio, has recently opened offices at 108 Union street, New Bedford, Massachusetts, this New England branch being in charge of John S. Fallow.

The Boston Woven Hose & Rubber Co., Cambridge, recently turned out the biggest conveyor belt ever made in its factory. It was a 42-inch, 8-ply belt, 800 feet long and weighing 10,300 pounds, or a little over 5 tons. Shipment was made to Juneau, Alaska, where it will be used in the mines for conveying gold ore.

The structure built some time ago by the Boston Woven Hose & Rubber Co. for the manufacture of leatherette, and until recently used as a storage house, is once more a scene of manufacturing activity. There is in operation a line of two mills and four refiners for shoddy reclamation, every detail of the complete installation being of the latest approved design.

Dr. Herbert J. Cronin, who instituted the First Aid Hospital for the Boston Woven Hose & Rubber Co., has resigned after eight years' service to devote his entire time to his private practice. He is succeeded by Dr. Edward R. Utley, a graduate of the Harvard Medical School, class of 1891.

The plant of the Grow Tire Co., Canton Junction, is being operated successfully by the receiver, Arthur H. Morse, a Boston attorney. The firm's distributers are being supplied as in the past, but the firm no longer maintains a Boston salesroom, having vacated the former United States Tire Co. building at 560 Commonwealth avenue.

The Converse Rubber Shoe Co. and Converse Tire Co., Malden, are now operating five instead of four days a week, the footwear production now being largely tennis lines for summer wear. Production of Converse Compression Cord tires is satisfactory. The firm has not gone beyond the experimental stage with balloon tires.

At the time of the April 19 holiday in the metropolitan district of Boston the plant of the Hood Rubber Co., Watertown, was shut down for one week for necessary repairs and machinery overhauling, following which operations will be resumed on a big production schedule of tires and footwear for summer wear. The Hood plant has run full time throughout the winter.

The Rubber Trade in Ohio

Manufactured Goods

Despite general predictions that April would witness a reduction of tire output in the Akron district, production continues the same as a month ago, although reductions are again looked for during the next thirty days. If reports are true that the automobile industry is over producing, there will be a resulting decline in the production of original equipment tires. Replacement tire production is said to be in excess of demand and as soon as the spring motor trade is supplied production will be curtailed.

However, tire output is now very close to 110,000 tires a day, including balloon tires which register in excess of 12,000 tires a day in the Akron district and in excess of 14,000 for the country as a whole. Increased use of trucks and buses throughout the country has been reflected in increased sales of truck tires and the larger pneumatic tires.

Rubber footwear production is now based upon anticipations for next year and upon early orders from the retail trade. The druggists' sundries business closed with a good season and preparations are being made for an even larger trade next season.

Hard rubber goods production reflects the growing interest in radio and manufacturers expect an increasing demand for battery jars and hard rubber parts used in radio equipment.

The novelty and toy business is developing rapidly and most of these departments and plants are operating at capacity. Mechanical goods business is good in Akron and departments continue to operate at previous levels. Demand for belting has shown large

increase during the past few weeks. Labor conditions remain normal.

H. S. Firestone Optimistic

Harvey S. Firestone, president of the Firestone Tire & Rubber Co., upon his return from the South expressed extreme optimism regarding the future of the automobile and the automobile tire business.

"The production of tires is growing by leaps and bounds. If automobile production continues throughout the year at the rate already shown the production for 1924 will come close to the 5,000,000 mark.

"We must recognize the motor bus as a permanent factor in transportation. Twenty-nine cities have enacted legislation regulating buses as common carriers. New bus lines have been established in sections of the United States, and today more than 40,000 buses are operated in this country.

"The automobile today is a necessity and not a luxury. Passenger cars, trucks, buses all have come to stay. We must have them. There are now more automobiles than telephones.

"Truck production has shown a healthy increase. During February of this year there were 31,000 trucks produced, against a total of 22,000 during the corresponding month last year."

Immediately upon his return Mr. Firestone went to Washington to study the information obtained by the Department of Commerce relative to the production of crude rubber in South and Central America. Mr. Firestone was the leader in the movement that resulted in the government's investigation of crude rubber sources.

Balloon Tire Production Increasing

About a year ago THE INDIA RUBBER WORLD published an insignificant item stating that several of the larger Akron companies were experimenting with a tire with four plies of fabric and requiring less air pressure than the standard tire, and that it would be used only on a wheel of 21-inch diameter. Less than four months after this statement was made, the balloon tire was on the market commercially, and less than eight months after this advent, production in the United States is estimated at 10,000 tires a day with prospects of going to 15,000 in a few months. One company is producing over 5,000 balloon tires a day and expects to make 7,500 a day. Another large company is making 2,000 a day. The Akron district is said to be making more than 80 per cent of the total output. Profits on balloon tires are estimated roughly at 25 per cent greater than on standard tires.

Akron Notes

The Firestone Tire & Rubber Co., Akron, Ohio, with the cooperation of its Steel Products Division, is now prepared to furnish complete changeover units, consisting of balloon tires, tubes, wheels and rims, which are being sold by all authorized Firestone dealers. The aim is to supply a service wheel to fit every car, the new wheels being, however, 20 and 21 inches in diameter instead of the usual 23 or 24 inches. Although now manufacturing its own wheels, rims, tires and tubes, the Firestone organization has planned production on so large a scale that prices for such equipment have been reduced to a very low point.

The annual stockholders' meeting of the Goodyear Tire & Rubber Co., Akron, Ohio, resulted in the reelection of the same board of directors and officials. The following directors compose the Goodyear board: George W. Crouse, W. M. L. Fiske, Fred M. Harpham, P. W. Litchfield, H. B. Manton, Grayson M. P. Murphey, John R. Nutt, Russel L. Robinson, Ross Schaffner, Armin Schlessinger, Francis Seiberling, H. H. Springford, George M. Stadelman, Ralph Van Vechten and E. G. Wilmer.

Mason Tire & Rubber Co., Kent, Ohio, is reported to be making 4,500 to 5,000 tires a day and to be adding men gradually to increase production further. The company's Bedford tire plant is said to be producing in excess of 1,500 tires a day, and it is in this plant that the additional help is being added. With increasing tire production it is necessary to add night shifts to its cotton mills in the South which have recently been operating on the basis of one shift of workers a day.

The rubber novelty business of the Miller Rubber Co., Akron, Ohio, is growing so rapidly that it is destined to be a larger factor in this company's products than other seemingly more important lines. During the past month the company has placed on the market several novelties based upon humorous characters of the day. The company's tire production is very close to capacity and its balloon tire output continues to grow.

The American Rubber & Tire Co. announces that R. W. Brouse, for some time sales manager, has resigned. Production, which has been permitted to drop to low figures due to some remodeling being done in the plant, is again increasing daily. Floyd C. Snyder has been recently elected president, succeeding F. H. Snyder, deceased.

The Seiberling Rubber Co., Akron, Ohio, will not place its tire plant at New Castle, Pennsylvania, in operation this year. Any expansion will be taken care of at the company's Barberton plant, where some vacant factory space is still available for machine installation. Company production continues at capacity of 1,800 tires a day.

The plan of cooperation in production and development work which has been established between several large Akron rubber companies and several located outside of Akron has been adopted by four of the smaller Akron companies. The concerns which are a part of this plan to reduce costs state unofficially that the movement is being developed and is proving beneficial. The companies in the new cooperative movement are among the higher class and better financed small companies of the Akron district.

Marked reductions in raw materials have resulted, it is said, in profits now being made of 75 cents to $1 each on the average tire, according to size and quality. Lower priced cotton and rubber since the beginning of the year has enabled some of the smaller companies to operate on a profitable basis, and is said to have prevented a large number of failures in the tire industry.

Many of the smaller concerns who were compelled for credit reasons to buy from hand to mouth have been able to take advantage of the lower material markets, while the large companies were covered by comparatively long term contracts. After the depression of 1920 it was the small producer who was without commitments and was able to take advantage of low material prices, while it was the long term contracts for rubber and fabric which resulted in the huge losses of the large producers. Because of lower price tendency in raw materials the rubber industry as a whole has been buying from hand to mouth as much as possible.

There was recently organized under the laws of the Dominion of Canada, The B. F. Goodrich Rubber Co., Ltd., a corporation of the Province of Ontario which heretofore had the same name, has changed its name to The B. F. Goodrich Limited.

A. G. Partridge, formerly vice-president and sales director of the Firestone Tire & Rubber Co. and more recently connected with the sales department of The B. F. Goodrich Co. has resigned. Information as to any new connection made by Mr. Partridge has not been given out.

Ohio Notes

The stockholders of The Buckeye Rubber Manufacturing Co., Willoughby, Ohio, recently elected the following officers: J. E. Weit, president and treasurer; M. J. Rentschler, vice-president and secretary; C. E. Hyke, general manager and assistant treasurer; and A. C. Schultz, factory superintendent. Directors for one year include the first three of the executives mentioned and also C. K. Arter and D. L. Rockwell. The factory is now being operated on a twenty-hour basis, which will probably be continued during the summer months.

Production is being increased by The Maderite Rubber Products Co., 3962 East 93rd street, Cleveland, Ohio, as the demand for the company's tires and tubes is said to be steadily growing. At the annual meeting the following officers were elected: R. W. John, president and general manager; W. V. Sleek, vice-president and director of sales; R. F. Manning, second vice-president and director of service; E. B. Haserodt, secretary and treasurer; and E. J. Ernst, factory manager. Directors include John R. Watson, Walter Buckius, and the executives above mentioned.

Republic Rubber Co., Youngstown, Ohio, has entirely suspended pneumatic tire production and will manufacture only mechanical goods. Tire production will be concentrated at the Conshohocken plant of the Lee Tire & Rubber Co., which purchased the Republic company several months ago.

The capital stock of the Dayton Rubber Manufacturing Co., Dayton, Ohio, has been rearranged to bring the fixed dividend burden in better relation to the company's capital and present earning power. Each preferred stockholder will receive for each share turned in and in payment of deferred dividends, a total of 1 1/6 shares, consisting of 2/3 share new priority stock and ½ share 7 per cent cumulative preferred stock. The company is now in its twentieth year of operation, and since 1920 has manufactured low pressure cord tires exclusively.

A decided advance is noted in the sales by the White Rubber Co., Ravenna, Ohio, the total figure for 1923 being $170,000, an increase of $70,000 over the previous year. The company manufactures fountain pen sacs, dropper nipples, finger cots, etc. Executives of the organization include: E. J. Smith, president and treasurer; J. E. Smith, vice-president; Sterling Smith, secretary; and J. L. Slates, factory manager.

The Reality Rubber Co., Massillon, Ohio, will build a new factory to replace part of the plant recently damaged by fire. The new unit is to be completed about the middle of July, and operations will be confined to the manufacture of surgeons' rubber gloves exclusively.

J. M. Alderfer, president of the India Tire & Rubber Co., Mogadore, Ohio, reports that the company enjoyed its largest business in February when the tire production was 800 a day. Since the company adjusts its production ticket weekly in conformity with orders on hand, he stated, a reduction in output for the month just closed was made to 700 tires a day. India is one of four well-known companies to continue dividend payments on its common stock throughout the depression and post depression period. Production has continued good throughout the period.

Reports indicate that a stockholders' committee may attempt the reorganization of the McGraw Tire & Rubber Co., East Palestine, Ohio, which has been in the process of liquidation under a receiver.

The former Ideal Tire & Rubber Co., Cleveland, Ohio, has been reorganized by a stockholders' committee and is now known as the Supreme Tire & Rubber Co.

The Rubber Trade in the Midwest

Midwest Rubber Manufacturers' Association

Several important matters were discussed at the Association meeting held in Chicago on April 8, while a number of committees and sub-committees were also appointed, these relating to such subjects as membership, finance, legislation, standardization of products, employes' welfare, export, publicity, research, etc. Following the announcement of the resignation of the former secretary, Charles S. Sutherland, came the appointment for one year of Thomas Follen, president of the organization, as his successor. The next meeting will be held on June 10, 1924, at the Athletic Club, 12 South Michigan avenue, Chicago, Illinois. The board of directors' meeting is scheduled for 11 a. m., and the luncheon and membership meeting for 1 p. m.

Midwestern Notes

The Lincoln Highway Rubber Co., Fulton, Illinois, is now manufacturing from 500 to 600 inner tubes a day, this output to be increased in the near future to 1,000 tubes. At the same time the production of tires of all kinds is soon to reach 500 a day. E. F. Lyon is president.

Operations on a 10-hour a day basis and with a production of 2,000 inner tubes is the schedule at the new plant of the Ott Rubber Co., Dubuque, Iowa. Later, and with the plant running 24 hours a day, a second and possibly a third shift will be added, when it is estimated that the daily output will amount to 5,000 tubes. The company's new plant was erected at a cost of approixmately $135,000. Frank E. Ott is secretary and treasurer.

Executives of The Mason Tire & Rubber Co., Kent, Ohio, state that K. R. Friedlander has been recently appointed manager of the company's branch at Des Moines, Iowa.

J. D. Wiggins is no longer president and general manager of The Inter-Continental Tire & Rubber Co., Indianapolis, Indiana, having resigned last September. The present officers of this company are: Charles E. Williams, president; Charles H. Franck, vice-president; and Parke G. Haynes, secretary and treasurer.

During February of the present year J. D. Wiggins was elected president and general manager of the International Rubber Company of America, Anderson, Indiana.

The Marathon Rubber Products Co., Wausau, Wisconsin, has been recently reorganized, while considerable improvements have been made both in the company's plant and equipment. Executives of the organization report excellent prospects for the sale of their special line of rubber surface clothing and raincoats. The newly elected officers of the company consist of W. C. Landon, president; George McIntosh, vice-president; and A. Burnett, secretary and general manager.

P. J. Perkins, until recently connected with the United States Rubber Co., will represent in Chicago and the surrounding territory the Marathon Rubber Products Co., Wausau, Wisconsin, maker of raincoats, rubberized fabrics, etc.

G. B. Atcheson, formerly a salesman at the Chicago branch of the Firestone Tire & Rubber Co., Akron, Ohio, has been recently appointed acting branch manager for the company's Minneapolis branch.

At the recent annual meeting of the stockholders of The Wildman Rubber Co., Bay City, Michigan, the following officers were chosen for the ensuing year: W. W. Wildman, president; Robert H. Rayburn, vice-president; James C. McCabe, secretary; and H. N. Gifford, assistant treasurer. The office of treasurer was left open for the time being. Directors include the first three executives mentioned and also the following: S. J. Tennant, L. C. MacGregor, H. P. Orr, and Thomas H. George. At the company's factory in Bay City there will soon be installed new equipment for the power plant, boiler rooms, etc., as well as additions to the company's present equipment of rubber machinery.

Reports that Montgomery Ward & Co., Chicago, Illinois, will establish a tire factory on the Pacific coast are absolutely unfounded, according to executives of the organization.

The production of rubber heels and mechanical rubber goods is being greatly increased at the plant of The Mineral Rubber Products Co., Moline, Illinois. New executives of the company include the following: A. G. Abraham, president and treasurer; Alec Montgomery, vice-president; Beder Wood, secretary; and P. H. O'Brien, sales manager.

The Brunswick Tire Corporation, Akron, Ohio, has arranged with the Central Tire Co., Mason City, Iowa, to handle Brunswick tires exclusively in the counties of Franklin, Worth, and Cerro Gordo, in the state of Iowa.

The Overland Trail Rubber Co., Omaha, Nebraska, is now running at full capacity with three shifts a day. "Pioneer" cord tires and "Overland" fabric casings and tubes are handled by the Waldmann Sales Co., 2044 Harney street, Omaha, headed by Mr. Waldmann who was for twenty years connected with the United States Rubber Co. W. Earl Thurber, sales manager, was formerly merchandise manager for the Sprague Tire & Rubber Co.

The Rubber Trade on the Pacific Coast

Manufactured Goods

A slowing-up in the building trade, believed to be only temporary, has diminished sales of mechanical rubber goods used in that line during the past month on the Pacific Coast. In some degree such slackening of sales has been offset by demand for rubber supplies in the oil industry, which has of late shown a marked revival. The scanty rains on the Coast have made the season a bad one for rubber footwear. Retail dealers, anticipating a fairly wet winter and early spring, had carried large stocks and they failed to market even a fair portion of them. With well-laden shelves, they are reluctant to order more. Eastern manufacturers advise them that, as they carry no reserve stocks at the factories, they are likely to be caught short and pay a premium for goods if next season proves very rainy. While trade in rubber footwear has proved disappointing that in tires has been good of late, despite the usual timidity shown in the buying of general merchandise on account of presidential year. While tire prices do not show as much margin of profit as heretofore, they have at least become stabilized, even among the so-called irregular makes.

E. G. Wilmer
President Goodyear Tire & Rubber Co. of California

Tire manufacturers on the Coast and distributers of eastern and midwestern tires do not appear to attach importance to the rumor current in the New York crude rubber market about an impending 10 per cent cut in tire prices. Rather they regard such a price cut as quite improbable in view of the increased cost of cotton and of other production items. A scattered but increasing demand is shown for balloon tires, although makers and dealers in standard cords do not anticipate that any appreciable inroads will be made by the balloons upon the cord field, at least for a long while to come.

Nearly all the garden hose ordered for the coming season has been distributed by the coast manufacturers and agencies of eastern mills, and the total volume of business has been well above that of a year ago, with excellent prospects for next season. Trade in druggists' sundries is holding up unusually well; and to a considerable degree the manufacture of many articles in this class, particularly toilet and household goods, is being taken up by rubber concerns of the Coast in competition with eastern and foreign-made goods. Business in rubber heels is excellent, sales of coast-made goods steadily increasing.

Rubber insulated and other electric covered wire sales are fair, and had the past season been a normally rainy one many very heavy orders would now be placed for station wire. The light snowfall in the Sierras forced several of the large hydro-electric companies to curtail power generation with the result of reduced sales, lessened income and retrenchment in outlay. One corporation with a $30,000,000 development program has deemed it advisable to defer for several months extension plans that were to have been carried out this spring, and which would have meant the purchase of a considerable amount of rubber-covered insulated wire.

California Goodyear Restores Preferred Dividend

The restoration of the preferred stock of the Goodyear Tire & Rubber Co. of California to a dividend basis after a lapse of over three years gratifies a host of shareholders, most of whom live in southern California; and as a result the stock has once again been quoted above 90. At the recent stockholders' meeting President E. G. Wilmer reported that the deficit of $3,157,762 of March, 1921, had been transformed by December 31, 1923, into a surplus of $908,085.10. If present earnings be maintained, it is said that the accrued preferred dividends of $24.50 a share may soon be fully paid. Total net sales for 1923 were $14,444,090, compared with $12,392,616 for 1922, and $14,069,733 for 1921. Unit sales for 1923 were 32 per cent greater than for 1922, and 71 per cent greater than for 1921. Net profits for 1923 were $1,743,221, as compared with $788,817 for 1922. The company reduced its debt to the parent Goodyear concern of Akron from $7,884,848 on December 31, 1922, to $5,343,654 on December 31, 1923. The company has no banking indebtedness. A profit of $951,032 was made in 1923 on surplus land, with about 25 per cent more to be credited for 1924.

The reelected officers of the Goodyear company are: President, E. G. Wilmer; vice-president and general manager, A. F. Osterloh; secretary, W. I. Lyon; treasurer, M. S. Kelley; general superintendent, H. E. Blythe; directors, E. M. Stadelman, A. F. Osterloh, Lee A. Phillips, E. G. Wilmer, M. S. Kelley, J. E. Jardine, P. W. Litchfield, H. E. Blythe, and H. H. Fair.

A mid-April development at the Goodyear factory was the making of balloon tires, molds and other equipment for the same having arrived after much delay. The mid-month ticket for cords was 3,500 daily, with 2,500 tubes. A recent visitor at the works was L. C. Rockhill, general sales manager at the Akron factory.

Pacific Coast Notes

It is said that there is a good prospect for the resumption of business by the Coast Tire & Rubber Co., which several months ago went into receivership. The company, with a capital issue of $2,000,000, had about 6,000 shareholders, and a large number of them have agreed to a proposal to put a mortgage of $500,000 on the company's plant in Oakland, the money to be used for paying urgent claims and to provide working capital. Old directors have resigned and new ones have taken their places. Two of the old officers are on trial in San Francisco charged with manipulating the stock.

F. C. Millhoff, general sales manager of the Miller Rubber Co., of New York and Akron, has lately been studying the coast territory. He is very favorably impressed with trade prospects in all of the Pacific States, and his company intends to strengthen its position considerably on the Coast.

E. M. Herr, president of Westinghouse Electrical & Manufacturing Co., of Pittsburgh, Pennsylvania, recently made a business and pleasure trip to the Coast. He was much impressed with the electrical power possibilities, as well as present development, in the high Sierras, and predicted a prosperous year, even though it may not surpass 1923.

J. B. Brady, manager of the Coast Division and executive vice-president of the United States Rubber Co., made a mid-month visit to the southern California territory, and reports business there in excellent condition. Sales in all staple lines are reported as very good. A specialty for which, it is said, the company is finding a rapidly growing sale is rubber-tiled flooring, many large contracts having recently been executed for new office buildings in several of the larger cities on the Coast.

Sales of conveyor and transmission belting, heavy hose, and mechanical rubber goods for factories have been exceptionally good of late, according to the report of the American Rubber Co., 417 Market street, whose factory at Park avenue and Watt street, Oakland, is one of the best equipped on the Coast.

Branch Manager J. B. Magee of the United States Rubber Co. reports a marked increase in business since the opening of the company's new headquarters three months ago at San Pedro and Eighth streets, Los Angeles. Several additions have recently been made to its outdoor sales staff. The company had a fine exhibit at the recent hardwaremen's convention in the Ambassador Hotel.

The Reilly Rubber Co., 2432 East 56th street, Los Angeles, reports a rapidly increasing output of tubes for distribution in Pacific Coast states and over-seas markets. It is also finding ready sale for an all-rubber elastic tire cover which without fastenings can be snapped on spare casings and is said to be sun and weather proof.

The B. F. Wade Co., Inc., 26th street and Santa Fe avenue, Los Angeles, with offices in the Grosse Building, has been reorganized under the name of the Burton-Wade Rubber Co., Inc. The concern has been producing a considerable quantity of tire flaps, reliners, and other rubber goods for automobiles, and of late has specialized on a rim-lock blowout shoe of much practical merit.

The Illinois Wire & Cable Co., Sycamore, Illinois, has completed plans for a new factory at Oakland, California, the buildings to contain approximately 30,000 square feet of floor space. Operations are scheduled to begin some time in July next. Only insulated electrical wires and cables will be manufactured. H. V. Engh is vice-president.

In order to accommodate increasing business, two removals to larger quarters have been made during the last two years by the branch now maintained at 51-65 First street, San Francisco, California, by the Hood Rubber Products Co., Inc., whose main offices are at Watertown, Massachusetts. M. D. Bixby is manager of the San Francisco branch.

Leo A. Lutz, formerly sales representative of the Dunlop Tire & Rubber Co., Buffalo, New York, has been appointed manager of the San Francisco division, and will serve tire and golf ball merchants in California, Washington, Oregon, Idaho, Utah, Nevada, New Mexico, and part of Montana. Kenneth C. Bugbee, formerly office manager of the Dunlop Sales Company will be office manager of the San Francisco branch.

The Rubber Trade in Canada

Manufactured Goods

BUSINESS the past month has improved in all rubber lines. Tire manufacturers are being pressed by retailers for deliveries. The approach of spring is received with expectation of a brisk business in sport footwear, such as tennis and rubber soled goods. Crêpe soled shoes are taking well and are being widely endorsed for sport and athletic purposes on account of the surer footing given over other rubber soles.

Garden hose has been selling freely since the middle of March. Rubber ground sheeting is an indispensable article for camping purposes and the establishment of motor camps throughout Canada has increased the demand for these goods. Mechanical rubber goods are in good demand. From recent building reports this summer will be a record one in the construction of homes and new buildings. Both transmission and conveyor belt equipment are well represented in volume of sales. Druggists' sundries and hard rubber goods are in good demand.

The Rubber Association of Canada

At the recent annual meeting of the Rubber Association of Canada held at Montreal, the financial statement showed that a 4½ cent contribution rate on crude rubber had produced a small favorable balance over expenses for the year, and it was decided to continue the same rate for 1924. The report of A. B. Hannay, the manager and secretary of the Association, recorded an active and successful year, without the business failure of a Canadian rubber manufacturer, and with one or two new rubber manufacturing companies inaugurated in Canada. He also reported the successful adjustment of the Canadian rubber manufacturing business to the new 6 per cent Dominion Government sales tax, and also an agreement between duck and rubber manufacturers upon testing standards for hose and belting fabrics. The report showed a substantial increase in the value of both domestic and export sales of Canadian fabricated rubber and a decrease in imports of rubber manufactures. During the year tires were manufactured to the number of 1,909,000, an increase of 900,000 over the production in 1921.

Canadian Sales Tax Reduced

While the income tax remains as before, the sales tax is reduced and customs duties substantially lowered. This is the substance of the taxation proposals advanced by the Hon. J. A. Robb, acting finance minister of Canada, in his budget speech, and showing the government has fully carried out what was intimated in the speech from the throne—a reduction in the cost of operating the basic industries of the country. It is proposed to reduce the sales tax on rubber footwear from 6 per cent to 2½ per cent. The sales tax has been reduced from 6 per cent to 5 per cent.

Canadian Notes

C. H. Carlisle, vice-president and general manager of the Goodyear Tire & Rubber Co. of Canada, Ltd., Toronto, announces that the company is in an excellent financial position, being without any fixed debt and having no bank loans. While earnings for the year will depend on the volume of business and the rapidity of stock turnover, it is anticipated that they will be satisfactory. The business volume has been good, but as a result of keen competition the margin of profit has been small. A complete line of balloon tires either for small wheels or to fit the wheels of the present cars will be offered very soon.

The B. F. Goodrich Co., Akron, Ohio, who acquired a substantial interest in the Ames-Holden Tire & Rubber Co., Ltd., formerly the Ames-Holden Tire Co., is busy installing new equipment at the Kitchener plant incidental to the manufacture of tires. The company intends gradually to expand its distributing and selling organization. At present the Goodrich company maintains three branches, one located in Toronto, Ontario, another in Montreal, Quebec, and one in Winnipeg, Manitoba.

The customs regulation providing that the dumping duty shall not apply when the difference between the fair market value of the goods and their selling price to importers in Canada does not exceed 5 per cent of their fair market value has been repealed. Consequently, after April 15 the dumping duty shall apply without exemption, except in cases of goods purchased before April 15, if they are entered for consumption on or before June 1.

Statistics compiled by the Toronto Board of Trade show that 71.92 per cent of the stocks, bonds, and other securities issued by incorporated and joint stock companies in Canada engaged in the manufacture of rubber footwear are held in the United States.

An illustrated lecture on rubber was given by Dr. G. S. Whitby at a recent meeting of the Northern Electric Engineering Society in Montreal. The lecturer is a Fellow of the Canadian Institute of Chemistry, and occupies the Chair of Associate Professor of Chemistry at McGill University.

Among the recent activities of the National Shoe Retailers' Association, the question of setting a minimum for the resale of rubbers was taken up by the president, C. R. LaSalle, with the president of the Rubber Association of Canada, and prospects are that arrangements will be made in accordance with the requests of the retailers in this connection.

R. W. Ashcroft, of Ames-Holden Tire & Rubber Co., Ltd., states that their factory in Kitchener, Ontario, has been and is the busiest mill in Canada. They have been running twenty-four hours a day with three shifts, for several months past, and expect to keep up this pace all summer.

C. W. Boyer, who was in charge of the rubber footwear department of Ames, Holden, McCready, Ltd., Montreal, and formerly manager of the Columbus Rubber Co., Montreal, has been appointed manager of footwear sales of Ames-Holden Tire & Rubber Co., Ltd., with headquarters at Kitchener, Ontario.

W. H. Miner, for many years an active member of the Montreal branch of the Canadian Manufacturers' Association, and at present vice-chairman of that organization, has been made chairman of the executive committee for the ensuing year. Mr. Miner is president of the Miner Rubber Co., Ltd., Granby, Quebec.

The Lee Puncture Proof Tire Co. of Canada, Ltd., is making arrangements to erect a factory in Montreal for the manufacture of automobile tires, etc.

At a meeting of tire manufacturers at Montreal recently it was decided to advance prices 15 per cent on all pneumatic tires for automobiles, and 10 per cent on all solid tires for motor trucks. These increases are due to recent advances of rubber on the British market. A further increase in tires is expected.

The Canadian No Blow Out Tube Co., Ottawa, Ontario, will erect a plant in Edmonton, Alberta, and W. Johnson, Barrister Trust Building, Ottawa, Ontario, requests information and prices on equipment for the manufacture of rubber tires.

F. C. Pauline, well-known tire dealer and salesman, has left Victoria, B. C., to take a position elsewhere. Mr. Pauline claims the honor of being the first to sell a set of balloon tires in the Province of British Columbia.

At a meeting of the Toronto Export Club, L. L. McMurray, Gutta Percha & Rubber, Ltd., Toronto, who has recently returned from an extensive business trip in the Orient and Australasia, described some of his experiences.

TIRE AND RIM ASSOCIATION REPORT OF RIMS INSPECTED AND APPROVED DURING MARCH, 1924

Size	Number	Per Cent
26 x 3 MC	7,305	0.3
28 x 3 MC	6,400	0.2
30 x 3 cl	73,821	2.8
28 x 3½ ss	128,153	4.9
30 x 3½ cl	1,067.574	41.8
30 x 3½ ss	460.792	17.6
32 x 3½	6,980	0.3
28 x 4 ss	65,502	2.5
29 x 4 ss	113,810	4.3
30 x 4 ss	32	0.0
31 x 4 cl	167,077	6.4
31 x 4 ss	575	0.0
32 x 4	201,334	7.9
33 x 4	38,685	1.5
34 x 4	500	0.0
29 x 4½	45,219	1.8
30 x 4½	8,322	0.3
31 x 4½	50	0.0
32 x 4½	160,658	6.3
34 x 4½	36,993	1.4
30 x 5	10,459	0.4
34 x 5	14,615	0.6
32 x 6	1,853	0.1
36 x 6	2,870	0.1
34 x 7	187	0.0
40 x 8	187	0.0
Total	2,620,953	100.0

"PNEUMATIC TIRES," BY HENRY C. PEARSON—This authoritative, comprehensive work fills a long felt want in the tire industry. It is written for tire manufacturers, dealers and repairmen.

Puncture and Repair of Balloon Tires

Whether or not balloon tires have been introduced a year too early in the history of their development, as some tire dealers are said to hold, they are undoubtedly here to stay and their success or failure will be demonstrated at the hands of the motoring public under service conditions.

In this connection questions arise as to the comparative liability to puncture of balloon tires compared to ordinary high pressure tires and whether vulcanized repairs can be made that will not detract from their balloon tire flexibility and shorten their period of serviceability. On these points the experience and opinion of tire manufacturers and repairmen are worth noting.

Manufacturers' experts assert that balloon tires do not puncture more readily than ordinary tires. Their claims are based upon comprehensive tests on the various sizes and types of balloon tires under all kinds of road conditions. Technical reasons why balloon tires should not puncture more easily than other tires are confirmed by practice.

The actual surface of contact made by a 7.30-inch balloon tire under load of 1,700 pounds is 36.04 square inches. The actual surface contact of a 5-inch high pressure tire, which is replaced by the 7.30 balloon, under load of 1,700 pounds is 20.16 inches. Thus, the load per square inch on the high pressure tire is 85 pounds, whereas on the balloon tire it is only 47 pounds. With less pressure on all parts of the contact surface there is less likelihood of puncture. The balloon tire rolls over obstructions in the road and, by flexing, absorbs the sharp obstacles which would penetrate the high pressure tire.

Claims that balloon tires will require fewer repairs on account of their less liability to injury seem to be offset in some degree by the need of larger and more expensive equipment made necessary by the increased size of the tire. In making major repairs, considerable new material is added to the tire, making it stiffer in the repaired section, which will resist flexure more than the remainder of the tire. This will tend to raise the tire when rolling over the repair, causing a hinging action at each end of the repaired part. When it is considered that a tire revolves approximately 8,000,000 times to cover a normal mileage, it seems impossible that these repairs can give service, especially with the greater percentage of deflation recommended.

Close attention to the maintenance of proper inflation pressure is requisite to avoid damage from under-inflation. A high pressure tire inflated to 80 pounds per square inch pressure would not be injured seriously if this pressure became reduced to 75 pounds per square inch; but a drop in pressure from 25 to 20 pounds per square inch for a balloon tire is a 20 per cent reduction, being great enough to cause serious damage to the itre. For comparison, a 20 per cent reduction of high pressure tire inflation pressure from 80 pounds per square inch would be to 64 pounds.

Tests of balloon tires indicate that they will operate at a greatly reduced temperature from that of the standard tire, particularly at the higher speeds. The ability of the balloon tire to operate at lower temperature is due to the use of fewer plies in the carcass and the increased size that enables it to radiate heat quickly.

NATIONAL CHAMBER OF COMMERCE TO DISCUSS TRADE ASSOCIATION ACTIVITIES

Among the important matters to be considered at the annual meeting of the Chamber of Commerce of the United States, to be held May 6 to 8 at Cleveland, Ohio, is the question of trade associations and their activities. The rights of such associations and their members will be fully discussed, while the purpose of the session will be to urge the formulation of recognized principles which would remove handicaps under which trade associations now operate, through fear of violating some law, rule or regulation.

The Obituary Record

General Manager, Pennsylvania Rubber Co.

SENECA G. LEWIS, vice-president and general manager of the Pennsylvania Rubber Co., died suddenly on April 14 at his home on Jacks Hill near Greensburg, Pennsylvania.

He was born in Hartland, Michigan, and was educated there and at Hillsdale College in the same state; after which he spent some two years on a ranch in the West. On his return he entered the employ of the Fletcher Hardware Co., Detroit, Michigan, in 1893, and later became manager of the sporting goods department and a director until 1903.

Seneca G. Lewis

In 1900, at Detroit, in company with W. F. Metzger, he promoted and managed the first automobile show held in the United States, and continued in management of this enterprise until he accepted the position of sales manager of the Winchester Repeating Arms Co. in 1904 with headquarters in New Haven, Connecticut.

While in Detroit he found time to cultivate his musical talent, and for a time it seemed probable that he would adopt this as his life work, but his final decision was for a business career. After five years with the Winchester company, his personal friend Charles M. DuPuy in 1910 induced him to undertake the reorganization of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, in which the DuPuy family was financially interested. Accomplishing this successfully, he acted as general manager and by progressive methods brought the company up to its present prominence. In 1918 he was elected vice-president as well as general manager.

With the officials and employes of his company, Mr. Lewis engaged in numerous helpful activities during the war, especially the care of returned soldiers and sailors needing assistance, to which fund he contributed liberally. He also wrote several patriotic compositions—a song, a march, and a one step—and dedicated the royalties, amounting to many thousands of dollars, to the "New York Sun" Tobacco Fund for smokes for our soldiers overseas.

Mr. Lewis played an important and helpful part in the development and progress of the tire industry. Having the happy faculty of viewing matters from the standpoint of the greatest good to the greatest number, he became a valued participant in the work of The Rubber Association of America. That organization was honored by his services as a member of the board of directors for five years, as chairman of the tire executive committee in 1921, and as an outstanding member of that body for several years past. His connection with the industry dated back to the old bicycle days and through the subsequent years his lovable characteristics made for him a countless number of friends and acquaintances who held him in high esteem and who knew him to be honorable, just, and capable. At a time when the experience, sound judgment and energy of men of his caliber are urgently needed to see the rubber industry through troubled waters, his passing is keenly felt.

Mr. Lewis was a member of several clubs in Pittsburgh, Pennsylvania, and New Haven, Connecticut, including the Duquesne Club, Pittsburgh Athletic Club and Westmorland Polo Club, of Pittsburgh, and the Quinnipiack Club and Question Club of New Haven.

Former Director of Manville Co.

During the first week of April occurred the death at Ossining, New York, of Charles Warren Lippitt, for many years a director of the Manville Co., Providence, Rhode Island, before its merger into the Manville-Jenckes Co.

Born in 1846, and the son of a former governor of Rhode Island, Mr. Lippitt became prominent in the social and political life of that state, serving twice as its governor. Early associated with his father in the textile industry, the subject of this sketch became in 1891 the president of the Social Manufacturing Co., continuing at its head for some ten years, until the merger of this plant with the Manville Mills as the Manville Co. was consummated, when he became director of the latter organization. Mr. Lippitt is survived by his widow and two sons.

Junior Partner of Lawrence & Co.

On the morning of April 4, Alexander B. Clough, junior partner of Lawrence & Co., Boston, Massachusetts, died suddenly at his office. Born 59 years ago, Mr. Clough early became identified with the textile industry, and, following his graduation from the Massachusetts Institute of Technology, was associated for some years with the Merrimack Manufacturing Co., becoming head of one of its departments. He went with his company when it was taken over in 1901 by Lawrence & Co., being admitted, in 1919, to a partnership interest in the latter organization. He is survived by his widow and a brother, W. E. A. Clough, president of the Hawley Folsom Co., of Boston.

Well-Known German Rubber Scientist

The well-known rubber technician and former technical director of the Semperit Oesterreichisch-Amerikanische Gummi-werke A./G., Edgar Herbst, died on February 16, 1924. He was born in 1855, in Osterwitz, Harz, and was educated at Halberstadt and Kassel. He took up chemistry and worked in the laboratory of the Heidelberg University and in Halle; later he became assistant in the Technical Institute in Karlsruhe.

From 1885 to 1887 he was chemist of the Farbenfabriken Oehler in Offenbach, and then went to the newly established factory of Schnek, Kohnberger & Mandel, which later on developed into the Semperit Oesterreichisch-Amerikanische Gummiwerke A./G., Vienna.

He stayed with this firm about 26 years.

The deceased was the author of a number of scientific and technical works on rubber, including "The Influence of Atmospheric Oxygen on Rubber." Together with Gottlob he wrote "Technology of Rubber Products," which he himself had first dealt with in 1908. In conjunction with the *Gummi-Zeitung*, he founded the "Rubber Calendar," which was published for several years.

Edgar Herbst was not only a man of wide knowledge and many interests, but also one who was of an upright character and a lovable nature. His death is keenly felt by all who came in contact with him.

The Rubber Trade in Europe

Great Britain

AS ATTENTION is being directed by the British Empire Exhibition in London to the important displays representing the English motor vehicle, cycle, and rubber industries, it is interesting to note the development of those industries, as revealed through statistics concerning production in 1922 and 1923. Not only was there in 1923 a 50 per cent increase in the output of private cars built in Great Britain, approximately 64,000, as compared with less than 40,000 in the year previous, but it is noted that English factories secured in 1923 over 60 per cent of the home trade along this particular line, while in 1922 their share was less than 50 per cent. According to reliable reports these factories will be able in the present year to exceed even this rate of progress, as for the first two months of 1924 exports of cars, chassis and parts, including tires, have increased by over 60 per cent as compared with the corresponding months of 1922.

Dunlop Activities Concentrated

The increasing developments and world-wide interests of the Dunlop organization have necessitated a concentration of the company's energies at Fort Dunlop, near Birmingham, where almost 10,000 workers are now being employed. According to Sir George Beharrell, one of the two managing directors of the organization, the manufacturing operations formerly maintained in England at the Pará Mills and Manor Mills, and the entire sales departments, are being transferred to Fort Dunlop as a center. The only exceptions are in the case of the overseas sales departments and the sales department for golf balls, both of which will be maintained in London. The factories in the United States, France, and Germany are said to be developing most satisfactorily, while there is splendid promise of trade expansion in India, South Africa, and South America.

To quote Sir George Beharrell: "The future of the British tire trade is largely a question of national prosperity. Given a good spell of trade, I see no reason why there should not be a vast accretion to the motoring requirements of this country in the coming twelve months. At the same time, the only chance for British firms to hold their own in the stress of world competition is by mass production, a point where America, with its protected home market, has such an advantage."

Development of British Rubber Footwear Trade

Exports of rubber footwear from the United Kingdom have shown an advance in the last two years, the volume during 1923 being 2,680,512 pairs of rubber boots and shoes as compared with 1,793,916 pairs in 1922, an increase of 49.6 per cent. The value of these goods for 1922 and 1923, respectively, was $1,198,858 and $1,653,990. Such exports from the United Kingdom are divided more or less equally between the British possessions and Europe, with other countries taking in 1922 less than 7 per cent of the total.

There are several important manufacturers of rubber footwear in England and Scotland, the principal contributors to export shipments being the North British Rubber Co., of Edinburgh; the New Liverpool Rubber Co.; the Waverly Rubber Co.; the Victoria Rubber Co.; and the Leyland & Birmingham Rubber Co. Of these organizations the North British Rubber Co. has the lead in the British exports of rubber footwear, maintaining also foreign warehouses and depots in the leading cities of Europe, Asia, and Africa, as well as in Canada and South America. In 1921 the total exports of British-made rubber boots and shoes to foreign countries and the British possessions were estimated at 104,609 dozen pairs, valued at £229,222, the figures rising in 1922 to 149,325 dozen pairs, valued at £269,667.

The domestic consumption of rubber footwear is comparatively small; not more than one in fifty of the population ever wears protective waterproof foot covering. The use of galoshes is very much restricted, although rubber boots are occasionally worn both by children and adults, and in the city as well as in the country districts.

British heel and sole manufacturers make a wide variety of specialties, such as heel and sole tips, sole pieces in the shape of crescents, circles, and diagonal strips. The shaped heels common in the American trade and composition soles, both full length and half length, are also produced. The common type of heel, however, is flat and round and affixed to the shoe with a screw through its center.

Closer Cooperation Among Rubber Producers

In a paper read in Brussels, Belgium, at the International Rubber Conference, James Fairbairn, taking as his subject "The Rubber Industry—A Plea for Closer Working," reviewed present conditions, particularly in connection with the producing side of the industry. He deeply regretted the lack of cooperation, instancing the case of the British and Dutch planters, but believed that "British producers should put their own house in order before seeking the adherence of others."

With so many sellers and so few buyers, some sort of a combination seems necessary, in order that the planting industry may meet the buyers on their own ground by getting the selling as far as possible in few hands. "American buyers cannot be blamed for wishing to buy at as low a figure as possible, but producers desire to get the best price they can and they should take measures to combine all producing interests for the purpose of selling the product." Mr. Fairbairn also referred to the recent American proposal, in which the rubber restriction scheme was mentioned, by means of which Congress was to permit the formation of agencies for the purchasing in common of raw materials at present alleged to be controlled by foreign monopolies. Mr. Fairbairn believed that if such a combination came into existence in America those representing the rubber producing industry would be forced to unite interests, and the European manufacturing industry as well, in order that they might meet and combat unfair competition. With all producing interests more in harmony, more reasonable business arrangements might be made with a combination of American manufacturers.

Institution of the Rubber Industry

Several very important papers have been read recently at the various meetings of the Institution of the Rubber Industry. On March 3 at a meeting of the London Section, D. B. Porritt and H. Rogers spoke regarding "The Life and Work of Thomas Hancock," Walter Hancock, as a member of the family, presiding. On March 13 at the Manchester session R. W. Lunn, in the absence of J. H. Mandleberg, read a paper on "The Mechanical Structure of Rubber," his speech causing considerable discussion.

W. Bond having also been unable to read his paper on "Solid Tires" at the London meeting on April 7, H. F. Trevillion spoke in his place on the subject "The Buyer Criticizes the Manufacturer." A short paper was also read by Dr. Drakeley on "Improvements in Education in the Ruber Industry." At Birmingham on April 24 H. S. Rowell, Director of the Research Association of British Motor and Allied Manufacturers, read an important paper on "The Efficiency of the Pneumatic Tire as an Engineering Feature of Motor Car Design." The coming session, which will undoubtedly be most helpful to all concerned, will be a joint meeting at the Engineers' Club, Coventry street, London, with the Society of Chemical Industry. On that occasion A. Van Rossem, Director of the Government Laboratories, Delft,

Holland, will read on behalf of the Institution a paper entitled "Latex, Its Chemistry and the Development of Its Industrial Applications." Dr. Henry P. Stevens will also open the discussion on behalf of the Society of Chemical Industry.

Institution of the Rubber Industry Diploma Scheme

In order to further investigation and study in connection with the many problems which confront the rubber trade, the Institution of the Rubber Industry has planned a scheme for awarding diplomas to those who can produce evidence of several years of practical experience in the industry, who have published some work of merit, or who have been in some way of signal service to the rubber industry. The diploma members shall be divided into the two classes, Associates and Fellows. Further information can be secured through the offices of the Institution.

British Notes

The South African Rubber Manufacturing Co., now carrying forward operations at Howick Falls, Natal, South Africa, is being maintained under the auspices of the Federated Rubber Growers and Manufacturers, Limited, a London enterprise consisting of an amalgamation of the British rubber manufacturing organizations known as George Spencer, Moulton & Co., Limited, and Wood-Milne, Limited. The new company's most important branch is the manufacture of rubber hose, although a variety of rubber commodities have been produced, including other lines of mechanical rubber goods, rubber footwear, toy balls, tennis and golf balls, rubber tiling, etc. Rubber tires under the trade name "Induna" have also been produced, and it is said to be the intention of the company to manufacture cord tires in quantity.

In the production of a new cycle and cycle-car tire made with weftless cord, the inventors, W. & A. Bates, Limited, St. Mary's Mills, Leicester, claim to have made a great advance in tire construction. The advantage is said to be that every strand is separately coated with rubber before being made into sheet form, thereby securing 50 per cent greater adhesion between the cords, and at the same time arresting the friction set up by the weft in ordinary cord fabric.

A guarantee of 7,000 miles is soon to be issued with each of the new cord tires manufactured by The North British Rubber Co., Limited. By means of a system of declaration cards the user can lodge a claim at any time should he consider the materials or workmanship at fault.

In commenting on the improved conditions of many of the rubber producing companies, as shown by their reports now being published for the year 1923, the editor of *The Financial Times* recently stated:

"The results disclosed by the above companies are, we consider, as good as could be expected. It is obvious that while restriction gives rubber undertakings a better price, the lower output entailed rather neutralizes this advantage. We have all along expressed the opinion that fifteen-penny rubber is not good enough, and, presumably, our view is justified."

Ireland

It is estimated that 45 per cent of the tires used here are British, 30 per cent French and 25 per cent American. The latter are becoming increasingly popular. Balloon tires are at present only offered by Dunlop and Michelin, the French firm pushing sales by mounting the tires on to special wheels which fit the leading makes of cars.

Czechoslovakia

Pneumatic tire imports in 1923 totaled 518 tons, value 17,807,646 crowns; of this France supplied 248 tons, value 10,133,764 crowns; Germany 189 tons, value 4,487,304 crowns; Austria 51 tons, value 1,531,632 crowns; United States 30 tons, value 1,654,946 crowns.

France

French imports of rubber and manufactures thereof increased in 1923 as compared with 1922. Thus the amounts for crude rubber were 370,708 quintals (quintal = 220.4 pounds), value 328,879,000 francs, against 307,960 quintals, value 118,653,000 francs in 1922. The greater part of this raw material came from the British colonies. Manufactured goods to the amount of 33,741 quintals, value 66,210,000 francs, were taken by France in 1923, instead of 27,828 quintals, value 58,507,000 francs, in 1922.

The principal imports were: rubber thread, vulcanized—4,308 quintals, value 13,597,000 francs, against 3,573 quintals, value 9,644,000 francs, in 1922; footwear—1,795 quintals, value 2,495,000 francs, against 1,564 quintals, value 2,118,000 francs, in 1922; tires and tubes—11,775 quintals, value 17,140,000 francs, against 14,589 quintals, value 18,861,000 francs; belting, hose and packing—10,138 quintals, value 24,478,000 francs, instead of 11,228 quintals, value 20,408,000 francs. Almost half the imports of manufactured goods came from England; one-fifth came from the United States, and about one-seventh from Belgium.

The exports of finished goods also show an increase, the totals being 219,484 quintals, value 605,893,000 francs in 1923, and 188,503 quintals, value 477,640,000 francs, in 1922. Of this footwear accounted for 15,196 quintals, value 30,696,000 francs, against 23,284 quintals, value 43,540,000 francs; tires and tubes, 181,692 quintals, value 500,380,000 francs, instead of 144,782 quintals, value 369,195,000 francs in 1922; belting, hose and packing, 15,525 quintals, value 28,504,000 francs, instead of 13,165 quintals, value 22,380,000 francs. England, Belgium, Switzerland and Spain, in the order named, were the biggest buyers of French tires.

Germany

The foreign business of the German rubber industry increased from 174,028 quintals in 1922 to 182,885 quintals in 1923. The rise was due to an increase in exports, the totals being 169,756 quintals in 1922 as against 180,327 quintals in 1923. Of the 1922 figures, 162,246 quintals represented soft rubber goods and 7,510 hard rubber goods, while in 1923 the amounts were 170,456 quintals for soft rubber goods and 9,871 quintals for hard rubber goods. The imports decreased from 4,272 quintals in 1922 to 2,558 quintals in 1923.

The rubber manufactures exported included: Automobile tire casings (also of leather), 251,767 in 1923 against 191,642 in 1922. Great Britain and her colonies took the largest quantities; the South American states came next. The number of automobile tubes were 226,058 in 1923 and 158,890 in 1922.

Bicycle tire covers totaled 2,092,011 in 1923 against 1,930,013 in 1922. Tubes for bicycles, however, decreased from 3,521,848 to 3,483,986 in 1923. There was also a decrease in the figures for hose—16,636 quintals instead of 18,405 in 1922. Figures for belting were 3,862 and 2,920 quintals for 1923 and 1922, respectively; for packing the totals were 4,830 in 1923 against 4,786 quintals in 1922. Footwear also showed an increase in 1923 when 7,489 quintals were exported as compared with 5,757 quintals in 1922.

Although exports rose during 1923, there was a marked decrease in all the imports of raw materials, indicating that manufacturers had been drawing heavily on reserve stocks. Crude rubber imports were 197,486 quintals instead of 287,955 quintals in 1922; gutta percha, 2,238 quintals and 6,661 quintals in 1923 and 1922, respectively; balata, 1,354 quintals instead of 3,496 quintals; waste, 25,002 quintals against 3,496 quintals.

At present there are 334 rubber factories in Germany, of which 22 are large or medium size, while 312 are small. Included in these 334 factories are 42 for surgical rubber goods; 37 making tires, 32 making soles and heels; 35, belting; 29, rubber stuffing-box packing; 24, cables; 19, impregnated fabrics; 11, balata goods. There are 2,470 dealers in rubber manufactures.

The year 1923 was an uneven year as regards business and, consequently, in employment of labor. In the spring, when the

domestic market was good, about 60,000 workmen were employed. However, this condition did not last, and right up to the end of the year there was increasing unemployment and several factories adopted a part-time schedule.

The situation was far from satisfactory at the beginning of 1924, but a steady improvement is being noted, more orders are coming in and the local demand is improving.

Spring Fairs

The improved conditions in Germany were reflected at the spring fairs at Leipzig and at Breslau. This year's fair at Leipzig has been characterized as one built on a solid foundation. Although foreign business was not extensive, owing to the fact that German prices are above the world's mark prices, domestic buying was unexpectedly active. The quality of the articles shown was on the whole good, although it must be admitted that the old-time practices of sharp competition—throwing cheap goods of inferior quality on the market—have again to some extent crept in. This is particularly the case with bathing caps. A cheap cap of comparatively good quality was offered at 0.90 to 1 mark; other firms offered caps similar in appearance at 0.60 to 0.65 marks. In rubberized fabrics, rubber coats, and toys, the same thing was noted.

In its way, the Breslau fair was also a success although there was a fair at Vienna at the same time which diverted a part of the buyers from the Breslau fair. At the latter it was interesting to note that a firm of Königsberg offered the manufactures of the Russian rubber trust. These included chiefly footwear, surgical goods and notions.

Balloon Tires in Germany

The Continental Caoutchouc und Gutta Percha Co. has just put on the German market two series of balloon tires, the first, ranging in size from 710 by 90 to 935 by 135, for use with the old style wheels, and a second series, 715 by 115, 730 by 130, 775 by 145, for use with the new type of wheels.

Prices of tires of the first series follow:

	Gold Marks	Dollars
710x90	83.00	19.76
760x90	87.00	20.72
880x120	111.00	26.43
935x135	146.00	34.76

Norway

Michelin is attempting to capture trade in Norway by dealing direct with consumers through the mails. Circular letters with order blanks were sent to consumers on February 25, setting forth that by ordering from the firm direct, Norwegian consumers would be sure of receiving fresh goods, at a price at least 15 per cent lower than other makes. Shipments would be made the same day orders were received, freight prepaid.

Denmark

Rubber footwear finds a ready market in Denmark, where sales may reach half a million pairs a year. Sweden is the chief source of supply, and in 1922, the last year for which detailed statistics are available, sent 82,600 kilos of the total 130,400 kilos imported in that year. At the same time America supplied 23,800, England 15,500 and Germany 8,500 kilos.

Swedish goods are well finished though slightly heavier than American products and, especially the Helsingborg articles, which have a very good reputation, are by many dealers considered to be the best obtainable.

American manufacturers are also well established. Their products are not considered to wear as well as the Swedish goods, but they offer a lighter shoe with better finish and in a much larger range of styles. Their prices are slightly lower than Swedish. Ladies' overshoes of a less well-known American brand sell at 5.50 kroners a pair. A large distributer is said to have ordered 3,000 pairs of men's foot-holds from the United States at 55 cents per pair, less 8 per cent, less 5 per cent, c. i. f. Copenhagen.

About a year ago a Danish company, subsidized by the government, started making a limited line of footwear, but the articles are not so well finished as those of foreign make. At present it claims an output of 500 pairs a day. It is, however, reported that the company is going into liquidation.

Competition from Germany, England and Canada is not serious. The Danish market does not require any special style or shape. Canvas linings are wanted in the cheaper grades and mixed flannel of a dark color for the better type.

Belgium

During 1923, Belgium exported rubber goods to the amount of 1,538,238 kilos, value 31,042,066 francs, against 1,454,076 kilos, value 21,686,231 francs in 1922. These exports included tires totaling 932,296 kilos, value 19,200,284 francs in 1923 and 957,596 kilos, value 14,260,164 francs in 1922; belting—leather as well as rubber—to the amount of 323,046 kilos, value 8,132,145 francs in 1923, instead of 235,379 kilos, value 4,649,738 francs in 1922; other rubber goods—282,896 kilos, value 3,709,637 francs in 1923, against 261,201 kilos, value 2,776,339 francs. In 1923, Great Britain was Belgium's best customer. Among other buyers of Belgian goods were France, the Netherlands, Switzerland and Belgian Congo.

Finland

In Finland the use of rubber hose is practically limited to water and steam conveyance; it is little employed for pneumatic tools and still less for lawn sprinkling. Most of what is used comes from the local factory, the Finska Gummifabriks A/B., at Nokia, and is of inferior quality but cheap. This factory also supplies much of the rubber transmission and conveyor belting, the kinds principally used, and competes keenly with the Americans who at present dominate the market. The local product is of good quality, superior to German makes, and in sizes from two to six inches sells at about 15 per cent less than the American article. Sizes above 6 inches sell at the same prices as American belting here, but above 10 inches the Finnish product is more expensive than the American.

The North British Rubber Co. and the Trelleborgs Gummifabriks A/B., of Trelleborg, Sweden, have recently entered the market; the latter firm has the advantage of being able to make quick deliveries. German products are not popular, owing to their poor quality and comparatively high price.

Holland

Official statistics show that the exports of rubber goods from Holland were valued at 1,906,000 guilders in 1922 against 1,657,000 guilders (guilder = $0.40) in 1921. The most important item was bicycle casings, the number increasing from 128,578, value 382,000 guilders in 1921 to 273,283, value 541,000 guilders in 1922 when 145,499, value 280,000 guilders went to Belgium; 80,120, value 147,000 guilders to Great Britain; 15,823, value 38,000 guilders to Denmark and Iceland; 12,922, value 31,000 guilders to Netherlands East Indies, and the rest to Sweden and Switzerland. Of the total of 10,794 automobile casings, valued at 483,000 guilders exported in 1922 (6,810, value 387,000 guilders in 1921), England took 3,507, value 148,000 guilders; Poland 1,443, value 56,000 guilders; Belgium, 1,311, value 66,000 guilders, Germany 1,250, value 50,000 guilders.

Other exports included rubber-proofed clothing and piece goods, valued at 255,000 guilders in 1922 and 559 guilders in 1921; footwear, 17,000 kilos, value 32,000 guilders against 2,000 kilos, value 4,000 guilders; solid tires, 1,939 against 345; motorcycle casings, 970 against 473; inner tubes, 105,004 against 86,288; gutta percha articles, 14,000 kilos instead of 2,000 kilos; and other rubber manufactures, 108,000 kilos instead of 55,000.

The Rubber Trade in the Far East

By Our Regular Correspondent

Netherlands East Indies

RECENTLY published statistics show that the amount of rubber exported from the Dutch Colonies, Malaya and Ceylon totaled:

	Dutch Indies	Malaya	Ceylon	Total tons
1923	137,896	183,811	39,972	361,679
1922	103,309	212,692	48,976	364,977

These figures show that the exports of the Dutch Colonies increased by 34,500 as compared with those for 1922, while the net exports of Malaya decreased by 29,000 tons and those of Ceylon by 9,000 tons. The Netherlands East Indies produced 38 per cent of the rubber output of the East against Malaya's 51 per cent and Ceylon's 11 per cent. Of course, since Malaya and Ceylon are restricting, it is only fair to say that under normal conditions their output would be considerably increased.

The Dutch exports, in tons, in the years 1921-22-23 follow:

	Java	Sumatra	Borneo	Celebes	Total tons
1921	29,399	41,480	2,749	68	73,696
1922	31,660	59,087	12,469	93	103,309
1923	34,079	80,774	22,905	138	137,896

Of the Sumatra figures, East Coast of Sumatra shipped 34,712 tons in 1921, 41,539 tons in 1922 and 47,671 tons in 1923, thus surpassing Java itself. The other districts of the Dutch colonies supplied rubber as follows:

Djambi (Sumatra). 2,925 tons in 1921, 9,667 tons in 1922 and 16,913 tons in 1923.

Riouw (Sumatra). 1,192 tons in 1921, 3,376 tons in 1922 and 7,489 tons in 1923.

Atjeh (Sumatra). 654 tons in 1921, 629 tons in 1922 and 923 tons in 1923.

Palembang (Sumatra). 72 tons in 1921, 894 tons in 1922 and 4,608 tons in 1923.

Lampongs (Sumatra). 548 tons in 1921, 738 in 1922 and 1,606 in 1923.

Tapanoeli (Sumatra). 1,279 tons in 1921, 1,703 in 1922 and 2,728 tons in 1923.

West Coast of Sumatra, 43 tons in 1921, 174 tons in 1922 and 539 tons in 1923.

Banka and Biliton, 31 tons in 1921, 351 in 1922 and 925 in 1923.

Southern and Western Division of Borneo, 732 tons in 1921, 7,952 in 1922 and 13,837 in 1923.

Western Division of Borneo, 2,017 tons in 1921, 4,517 in 1922 and 9,068 in 1923.

The above demonstrates the remarkable growth of exports from Sumatra and Borneo, particularly from Borneo and the districts of Djambi and Palembang, all of which, by the way, are known for their extensive native plantations.

The Java Rubber Planters' Association

A matter that is being widely discussed in local papers is the scheme for establishing an association of rubber planters to be known as the Java Rubber Planters' Association.

The International Society for Rubber Cultivation in the Netherlands East Indies requested its delegates in Java, Messrs. D. Birnie, C. M. Hamaker and T. Ottolander to form a committee including the representatives of the existing organizations to discuss and investigate the proposed statutes of the Java Rubber Planters' Association, the proposed organization of the rubber experiment stations, and the proposed relation and cooperation with the experiment stations of the mountain cultures. The aim of all this is a better organization of the rubber planters.

The new association will be established at Batavia and for a period of 25 years. It will protect the interests of rubber in Java, be composed of the owners and be divided into four divisions, West Java, Middle Java, East Java and Besoeki.

The Central Rubber Station and the West Java Experiment Station will combine to form a central rubber experiment station with branches in Salatiga, Malang and Djember, and will act for the entire Java rubber cultivation as far as scientific work is concerned. This work will be concentrated as far as possible at the Central Station at Buitenzorg.

The proposed association is considered to be the latest move of the British acting through the International Society; the society threatens to stop all contributions to local organizations if the new association is not formed before 1925. The British would be a strong minority in such a bond, as it is called, and might rapidly force the Dutch into the background.

It is hinted that English action is influenced quite as much by the attitude of the Dutch concerning restriction as by any other consideration.

Malaya

The Dutch and Restriction

In a supplement of the *World's Rubber Position*, W. H. Rickinson & Son states that it would not be profitable for the Dutch to restrict because if the price was raised to 1*s.* 6*d.* the output would increase. On the other hand a modification of the Stevenson plan would benefit the Dutch but be detrimental to the British.

The *Straits Times*, referring to this statement, calls the whole argument unsound, and points out that before the export percentage may be increased the price of 1*s.* 6*d.* per pound must have been maintained for at least three months and that the output automatically decreases when the price falls. On the other hand, it has always been suggested that the Dutch be allowed to restrict at a lower rate than the British. In any case, if the Dutch did not restrict, rubber would be down to the bottom again, which was not exactly to be preferred to rubber at 1*s.* 6*d.* a pound.

The *Malay Mail* discusses a different point of view, namely, that with the Stevenson plan as it is, Dutch cooperation would not necessarily be a help but might even be a handicap! That if the price rose through reduction of current supplies, the percentage exportable allowed to Malaya and Ceylon would increase, thus nullifying Dutch restriction. In some cases it might even be advantageous to turn out rubber on which more than the minimum duty was payable. This would result in increased supplies and as a consequence rubber prices would drop again. This paper suggests that if the Dutch should agree to take up restriction, the scheme should be modified; that is, the sliding scale should be abandoned, for say a year, during which the Dutch and the British would restrict according to certain minima decided upon for each.

The Puzzle of Native Rubber

Messrs. Ritchie and Bannon, who went to Java to discuss restriction with the Dutch, have just returned and probably the most important news they brought back was that an investigation of the extent and possibilities of native Javanese rubber would promptly be instituted.

How necessary this is, may be judged from official figures for the four months November to February, 1923-24, and of the same period during 1922-23. Almost all of the so-called foreign rubber that comes to Malaya for reexportation is said to be from the Dutch colonies.

This rubber is native produce sent here in a dirty, wet condition to be reworked into sheet and crêpe.

In the four months of 1922-23 imports of native rubber amounted to 18,181 tons, which was almost double the amount that was sent here during the corresponding period of the year before. In the four months of this year, the total rose to 31,314 tons, an increase of 13,133 tons over last year, and of over 20,000 tons over the year before.

The most reliable estimates give the output of European estates in 1923 as 92,000, and of native rubber (allowing 20 per cent for moisture) 46,000 tons, a total of 138,000 tons. However, if production continues at the rate indicated above, the Dutch colonies may export during 1924 100,000 tons from European estates and 90,000 tons from the natives, which would make of Malayan restriction a farce.

The *Straits Times* considers all this, and the sum of its consideration is as follows: Native rubber in its crude, wet state does not bring more than 20 cents (Straits) per pound, at which figure the total native output of 1923, 45,000 tons, yields $20,160,000. On the other hand, European output was 92,000 tons at an average of 50 cents a pound, which gives a total of $103,040,000. Now if the output of native rubber doubled, the price of European would go down ten cents a pound, and of native five cents a pound; then the totals would be 90,000 tons native rubber at 15 cents yielding $30,240,000, and 92,000 tons European rubber at 40 cents bringing $84,432,000.

The total in 1923 was $123,200,000 and in 1924 would be $112,672,000, a decline of 10½ millions; the loss to Europeans would be over twenty millions, while the natives would be gaining that much. Thus it would actually pay the Europeans to compensate the natives for restricting, and this is a point for investigation.

Extensive Rubber Smuggling

Further evidence that rubber smuggling is being practiced on an extensive scale is the report that most of the so-called fishing boats in these waters are camouflaged smuggling craft. At a meeting of the Straits Legislative Council a prominent Chinese stated that a large business in "illicit" rubber was being done in the kampongs. The smugglers fight the government with the best of weapons—bribery. The government has provided six fast sea-going motor boats to patrol the waters in these parts, but it is held that smuggling is so extensive that this is not nearly adequate.

Here is a peculiar state of affairs. It is said that restriction is being thwarted by the big Dutch exports, chiefly the native rubber. It is known that smuggling is being indulged in on a large scale and it is questioned whether a large part of the above native rubber imports is not really smuggled Malayan rubber sent back again. Therefore, why threaten the Dutch, when the Chambers of Commerce oppose certificates of origin, the only effective means to suppress smuggling?

Rubber Lining for Ball Mills

The pioneer articles in THE INDIA RUBBER WORLD on rubber lined ball mills have created much interest here. Planters hope that rubber will be extensively used for this purpose, while engineers take a more technical view of the matter. The manufacture of rubber linings may well be taken up by local manufacturers of rubber goods. It is understood that Dr. W. R. Jones, of the Malayan China-Clay and Pottery Works, Gopeng, is trying to get such linings made in a rubber factory in Singapore.

Ceylon

There is apparent here a growing feeling that Malaya is not playing the game by restriction. In Ceylon, restriction was never regarded with favor and the Stevenson plan would probably not have been accepted if Ceylon could have had her own way. Now the plan is being given a fair trial and it is believed that restriction would be all right if Malaya toed the mark. It is felt that something must be wrong with restriction in Malaya if it brought about only the small reduction noted last year. Local criticism is inclined to be all the more severe because it is openly said that much of the so-called Dutch rubber is Malayan rubber smuggled to the Dutch colonies and reshipped to Malaya as foreign produce.

Another grievance here is that strong efforts are being made to impose similar regulations regarding reassessment as have already been enforced in Malaya. However, Ceylon has plainly indicated its view of the matter and its unwillingness to pay the piper while Malaya calls the tune by the fact that assessments recently issued were on the old basis, with additional allowances for new areas.

Ceylon Rubber Industry—1923

The *Times of Ceylon* of January 19, 1924, gives an interesting review of rubber during 1923. The summary of the market begins at the gloomiest period before restriction, July, 1922. At the first auction in that month, standard grades sold at 45 cents and at the beginning of August the figure was 44. On October 5 there was a rise to 52 cents (100 cents = 1 rupee = $0.33), and another to 75 cents later on in the month. There was a fall to 71 cents in November, when restriction became effective, but by December rubber was bringing 85 cents. The high-water mark was reached in March, 1923, when standard grades obtained 1.07 rupees. Thereafter the market began to drop and after various ups and downs began to steady about October, when 78 cents was reached. Up to the end of the year prices fluctuated between 77 and 80 cents.

A table of exports and values supplied by the collector of customs follows:

Period	Quantity in Pounds	Value in Rupees
1921	88,125,425	51,601,518
November 1, 1921, to October 31, 1922	102,911,169	53,892,387
1922	104,595,278	56,970,218
November 1, 1922, to October 31, 1923	86,207,857	73,391,185
1923	83,816,228	73,594,389

Although restriction was enforced in November, 1922, it took five months for any beneficial effects to be felt. This was due to the fact that free exportation of rubber tapped and in stock prior to that date was permitted.

The following table of the total exports of Ceylon-produced rubber for the first restriction year shows how stocks of free rubber were released.

		Restricted Rubber Tons	Stocks Tons	Total Tons	Rubber Latex Gallons
1922	November	2	3,704	3,706	.....
	December	663	3,360	4,023	.....
1923	January	2,953	1,683	4,636	1,446
	February	2,777	655	3,432	2,421
	March	3,369	486	3,855	674
	April	2,275	251	2,526	2,659
	May	2,654	68	2,722	3,110
	June	2,662	103	2,765	843
	July	2,652	24	2,676	.....
	August	2,664	5	2,669	.....
	September	2,513	16	2,529	7
	October	2,304	5	2,309	6⅓
	Total	27,488	10,360	37,848	11,186⅓

Imported rubber re-exported from Ceylon amounted to 2,289 tons during the same period, and 2,282 tons for the year 1922.

IN THE ORDER GIVEN, MEXICO, CUBA, AND THE PHILIPPINE Islands are the leading markets for American exports of rubber heels and soles. In both 1922 and 1923 each of these countries took over 200,000 pounds of rubber heels and soles of American manufacture. What proportion of the trade consists of rubber soles is not definitely known, but it is certain that it is only a small part of the total.

Recent Patents Relating to Rubber

The United States

Issued* March 18, 1924

1,486,865 Cushion wheel. W. M. Decker, Buffalo, New York.

1,486,866 Sound producer. L. DeForest, New York, N. Y., assignor by mesne assignments to DeForest Phonofilm Corporation, Jersey City, New Jersey.

1,487,165 Tire. E. C. Jacobson, Roy, Washington.

1,487,256 Pneumatic abrading cushion. A. W. Mall, Milwaukee, Wisconsin.

1,487,261 Tire flap. L. Oppenheimer, El Cajon, California.

1,487,384 Pneumatic tire. A. A. Holle, Paddington, London, England.

1,487,621 Scrubbing glove with elastic straps. J. Thomas, Aberdeen, Washington.

1,487,623 Tire protector. M. Thompson, Nyack, New York.

1,487,658 Ball lacing device. C. J. Jensen, North Plainfield, New Jersey.

Issued* March 25, 1924

1,487,771 Tire inflation testing device. I. A. Weaver, assignor to the Weaver Manufacturing Co., both of Springfield, Illinois.

1,487,851 Tire inflation device. W. P. Hammond, Passaic, and T. A. Hammond, Rutherford, both in New Jersey, assignors to A. Schrader's Son, Brooklyn, New York.

1,487,920 Emergency tire. L. J. Dawson, Kansas City, Missouri.

1,487,923 Inflatable swimming device. J. A. DeVilbiss, assignor to G. Kapp, both of St. Louis, Missouri.

1,487,947 Transmission band lining. J. Jones, Newark, Ohio.

1,488,004 Air container. A. G. Fitz Gerald, Brookline, Massachusetts.

1,488,049 Armlet for bathers. W. T. Lawless, London, Ontario, Canada.

1,488,265 Inflatable cover for lamps and the like. I. N. Matsuo, Chicago, Illinois.

1,488,391 Valve with hard rubber annular seat. M. C. Hoskin, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

Issued* April 1, 1924

1,488,536 Protective garment with waterproof shoe and leg portions. W. L. Fry, New Rochelle, New York.

1,488,739 Cushion heel. W. P. Cosper, Milwaukee, Wisconsin, assignor to Nu-Mat-Ik Rubber Heel Co., Chicago, Illinois.

1,488,743 Thermal treatment bag. A. C. Eggers, Brooklyn, New York, assignor to The Goodyear India Rubber Glove Manufacturing Co., a corporation of Connecticut.

1,488,773 Corset made substantially of pieces of elastic. A. M. Anchorstar, New York, N. Y.

1,488,777 Syringe. R. L. Clements, Philadelphia, Pennsylvania, assignor to The S. S. White Dental Co., a corporation of Pennsylvania.

1,488,813 Relief valve for pneumatic tires. W. C. Hagen and Ralph A. Haas, Marion, Ohio.

1,488,900 Rubber grip for playing clubs. G. M. Armstrong, Baltimore, Maryland.

1,488,906 Spring insert for dust caps. J. A. Bowden, Los Angeles, California, assignor to A. Schrader's Son, Inc., Brooklyn, New York.

1,488,924 Dust cap for tire valves. W. T. Hunter, Jr., Woodhaven, assignor to A. Schrader's Son, Inc., Brooklyn, both in New York.

1,488,943 Dust cap. M. C. Schweinert, New York, N. Y.

1,488,998 Combination air inflated tube and filling of gas impregnated vulcanized spongy rubber within tube, said filling being united to the wall of the tube at line of union only. C. L. Marshall, London, England.

Issued* April 8, 1924

1,489,237 Ribbed cushion tire reinforcement. P. S. Donham, Cory, Indiana.

1,489,364 Cap for tire valves. M. C. Schweinert, West Hoboken, New Jersey.

1,489,432 Pneumatic tire with detachable shoe. W. W. Gallemore, Mendon, Illinois.

1,489,433 Window guide channel and method of making it. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,489,484 Window guide channel and method of making it. E. E. Davidson, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,489,550 Rubber quoit. C. T. Shaffer, San Francisco, California.

1,489,569 Inner tube. P. R. Welton, Cuyahoga Falls, assignor to The Akron Engineering Co., Akron, both in Ohio.

1,489,589 Vehicle tire and rim. C. E. Bonine, Cheltenham Township, Montgomery County, Pennsylvania.

1,489,784 Sanitary pad. D. C. O'Shea, Chicago, Illinois.

1,490,036 Tire pressure gage. C. C. Shepard, Washington, D. C.

1,490,045 Fountain pen. A. Trail, Calgary, Alberta, Canada.

1,490,059 Life saving suit. O. A. Youngren, New York, N. Y.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Granted March 25, 1924

238,790 Rubber heel, S. Adamczyk, Chicopee, Massachusetts.

Granted April 1, 1924

238,956 Tire repair device. E. M. Simpson and J. H. Buckles, both of Loomis, Washington, U. S. A.

238,969 Rubber and plywood heel. J. E. M. Cooke, Stafford, England.

239,013 Inner tube. W. P. Porter, New York, N. Y., U. S. A.

239,030 Metatarsal arch support. J. Valentine, Winnipeg, Manitoba.

239,062 Hookless fastener gaiter. F. H. Martin, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

239,081 Mold for rubber heels. W. Bernstein, Jamaica Plain, assignor to The Panther Rubber Manufacturing Co., Stoughton, both in Massachusetts.

Granted April 8, 1924

239,128 Puncture-proof tire. G. E. Stuart, and Charles A. Stewart, both of Oregon City, Oregon, U. S. A.

239,154 Pneumatic tire with inner band of thick rubber. M. N. A. Develay, Paris, France.

239,177 Elastic band tourniquet. A. E. Henderson, Toronto, Ontario, Canada.

239,198 Tire valve. W. H. McCourt, Drummoyne, near Sydney, New South Wales, Australia.

239,203 Reinforced pneumatic tire. H. Nicholson, Chicago, Illinois, U. S. A.

239,250 Pneumatic tire tread. The Goodyear Tire & Rubber Co., assignee of B. Darrow, both of Akron, Ohio, U. S. A.

239,261 Rubber heel. The Panther Rubber Manufacturing Co., Stoughton, assignee of W. Bernstein, Jamaica Plain, both of Massachusetts, U. S. A.

The United Kingdom

Published March 5, 1924

209,440 Low pressure tire. Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, and C. Macbeth, Fort Dunlop, Erdington, Birmingham.

209,499 Pneumatic buffer with tubular rubber body. B. V. Smith, 85 Barclay Road, Warley Woods, Worcestershire.

209,501 Rubber finger-piece pad for line-spacing lever of typewriters. C. G. Redfern, 15 South street, Finsbury, London. (W. V. Redfern, A. E. Redfern, and C. E. Redfern, Victoria, British Columbia, Canada.)

209,502 Rubber finger-piece pad for line-spacing lever of typewriters. C. G. Redfern, 15 South street, Finsbury, London. (W. V. Redfern, A. E. Redfern and C. E. Redfern, Victoria, British Columbia, Canada.)

209,616 Necktie with elastic neckband. J. E. Fowler-Dixon, 35 Carleton Road, Tufnell Park, London.

209,654 Soft rubber valve for football bladders. H. Verry, 16 Tower street, King's Lynn, Norfolk.

209,660 Cushion tire. E. H. Fitch, Hudson, Ohio, U. S. A.

209,691 Rubber horseshoe pad. F. J. Tinker, 34 Iron Mill Lane, Crayford, Kent.

209,734 Tire valve. P. T. Purcell, 423 Boundary street, Springhill, Brisbane, Queensland, Australia.

209,736 Armored tire. J. M. Pousset, Tarare, Rhone, France.

209,747 Tire valve. D. Peyrie, 12 Rue de l'Orient, Toulouse, France.

Published March 12, 1924

209,851 Detachable rubber studs for soles. Bell's (Glasgow), Ltd., and G. Bell, 111 Union street, Glasgow, Scotland.

209,891 Wind screen wiper. F. Evans, 7 Wellgarth Road, Knowle, Bristol.

209,908 Sponge rubber shaving brush. A. J. Line, 391 City Road, Edgbaston, Birmingham.

209,935 Self-healing inner tube. R. P. Meyers, Elm Grove, Rathmines Road, Dublin, Ireland.

209,944 Reinforced inner tube. E. B. Killen, 27 Queen Victoria street, London.

Published March 19, 1924

210,177 Dust caps for tire valves. M. C. Schweinert, 42 Riverside Drive, New York, N. Y., U. S. A.

210,218 Golf-practising device. F. J. Tippen, 15 Lottie Road, Selly Oak, and H. K. Prosser, Woodstock, Poplar Road, King's Heath, both in Birmingham.

210,230 Hot water bottle. O. Y. Imray, 30 Southampton Buildings, London. (Seamless Rubber Co., Inc., 253 Hallock avenue, New Haven, Connecticut, U. S. A.)

Chemical Patents will be found on page 517, Machinery and Process Patents on Page 520-521

210,300 Sheet rubber covering for vehicle bodies. H. P. Dick, Stonehill, Horeham Road, Sussex.

210,359 Puncture-proof cushion tire. F. G. Cole, 16 Hitherfield Road, Streatham, and L. H. Quin, Northdene, Chatsworth Road, West Norwood, both in London.

Published March 26, 1924

210,478 Sheet feeding machine with sponge rubber roller. A. E. Alexander, 306 High Holborn, London. (Stokes & Smith Co., Summerdale, Philadelphia, Pennsylvania, U. S. A.)

210,487 Tooth brush and polisher with rubber cover. J. R. Fair, 49 Pembroke Road, Dublin, Ireland.

210,498 Elastic device for preventing and curing bone displacement in the foot. F. W. Holland, 46 South Audley street, London.

210,575 Inflatable foot cushions. G. A. Johnston, Kirton, London Road, Guilford, Surrey.

210,673 Studded heel pad. E. Junker, 158 Hampstead Road, St. Pancras, London.

210,680 Hot water bottle of uncured rubber. Plantation Rubber Manufacturing Co., Ltd., and M. M. Dessau, 14 Mincing Lane, London.

210,690 Laminated heel of plywood, rubber, etc. V. Buckland and H. Hawkins, 68 Windmill Road, West Croyden, Surrey.

Published April 2, 1924

210,833 Fabric and rubber cycle saddles. H. Jelley, Coleridge Chambers, Corporation street, Birmingham, and J. Jelley, Bedford House, Brays Lane, Coventry.

210,843 Reservoir shaving brush with vulcanized handle and tube. G. Hibbert, 8 Brunstance Gardens, Joppa, Edinburgh.

210,844 Molded rubber cycle saddle. H. Jelley, Coleridge Chambers, Corporation street, Birmingham, and J. Jelley, Bedford House, Brays Lane, Coventry.

210,845 Fabric and rubber cycle saddle. H. Jelley, Coleridge Chambers, Corporation street, Birmingham, and J. Jelley, Bedford House, Brays Lane, Coventry.

210,888 Infant's pacifier. R. S. Dowell and A. W. Dowell, Globe Works, Chatsworth Road, Clapton Park, London.

210,916 Cord tire. A. A. Hole, Oxford Terrace, Paddington, London.

211,048 Rubber tourniquet. R. Haddan, 31 Bedford street, Strand, London.

211,057 Elastic woven fabric. G. C. Moore and T. Moore, Westerly, Rhode Island, U. S. A.

211,081 Laminated tire. P. C. Rushen, 28 Southampton Buildings, London. (Morgan & Wright, Jefferson Avenue, Detroit, Michigan, U. S. A.)

211,102 Cigar holder with rubber sleeve. O. Hendler, Sallmansdorf, Vienna

New Zealand

Registered February 7, 1924

49,975 Football. T. Dudson, 42 High street, Abertridwr, near Cardiff, Glamorganshire, Wales.

Registered March 6, 1924

50,687 Inner tube. G. R. Colby, 361 East Burnside street, Portland, Oregon, U. S. A.

Germany

Patents Issued With Dates of Issue

392,261 (May 24, 1922). Nipple with insert, for infants. Johanna Wieck, née Grieme, and her children Irma Wieck and Christiane Wieck, Trelleborgerstrasse 23, Berlin-Pankow.

392,715 (March 7, 1922). Syringe. George Graham, Trompsburg, South Africa; represented by H. Neubart, Berlin, S. W. 61.

392,852 (June 23, 1922). Double walled air chamber. Anders John Ostberg, East St. Kilda, near Melbourne, Australia, represented by A. Kuhn, Berlin S. W. 61.

393,166 (October 24, 1922). Rubber container for holding liquids. Robert William Sampson, Malba, New York; represented by R. Schmehlik and Satlow.

393,209 (October 20, 1922). Rubber toys. Max von der Heyden, Helmstedterstrasse 17, Berlin-Wilmersdorf.

Design Patents Issued, With Dates of Issue

864,041 (July 14, 1923). Rubber heel, Emil Braunschild, Tattersallstrasse 6, Mannheim.

864,042 (August 6, 1923). Rubber carpet with design. Continental-Caoutchouc und Gutta Percha Compagnie, Hannover.

864,043 (August 6, 1923). Rubber carpet with design. Continental-Caoutchouc und Gutta Percha Compagnie, Hannover.

864,044 (August 6, 1923). Rubber carpet with design. Continental-Caoutchouc und Gutta Percha Compagnie, Hannover.

864,194 (December 29, 1923). Colored rubber button. Harzer Hosenträger- und Gürtelfabrik Gerhard Hohn, Goslar.

864,325 (October 20, 1922). Rubber sole. Mitteldeutsche Gummiwarenfabrik Louis Peter A. G., Frankfurt-am-Main.

864,371 (January 22, 1924). Rubber heel. Edward Lingel, Schuhfabrik, A. G., Erfurt.

864,459 (November 30, 1923). Rubber heel. Hans Lehmann, Lutherstrasse 20, Leipzig.

864,639 (July 14, 1923). Rubber sole. Otto Kahlau, Alt. Moabit 64, Berlin, and Hans Peters, Volksdorferstrasse 2, Hamburg.

864,648 (December 21, 1923). Rubber belt. Varwerk & Sohn, Barmen.

864,662 (January 19, 1924). Rubber foot protector. Franz Noetzel, Hasselbrookstrasse 165, Hamburg.

864,835 (June 28, 1923). Bathing cap. Firma Carl Plaat, Köln-Nippes.

864,836 (June 28, 1923). Rubber cover for traveling blanket. Firma Carl Plaat, Köln-Nippes.

864,837 (June 28, 1923). Rubber apron. Firma Carl Plaat, Köln-Nippes.

864,838 (July 2, 1923). Sheet or band-shaped rubber article. Firma Carl Plaat, Köln-Nippes.

864,839 (July 5, 1923). Rubber coat. Firma Carl Plaat, Köln-Nippes.

864,841 (August 3, 1923). Rubber bathing skirt. Firma Carl Plaat, Köln-Nippes.

864,842 (August 15, 1923). Rubber wading panties. Firma Carl Platt, Köln-Nippes.

865,045 (January 17, 1924). Rubber heel. Kongo Gummi-Gesellschaft, H. Charmann, Dusseldorf.

865,135 (January 10, 1924). Attaching plate for rubber heels. Walter Schulte, Ludenschied, i. W.

865,217 (June 26, 1923). Rubber hat or cap. Firma Carl Plaat, Köln-Nippes.

865,234 (January 22, 1924). Rubber ball. Nordgummiwerke A. G., Berlin.

865,277 (February 1, 1924). Rod insulation. Deutsche Packungs und Asbest Fabrik, Max Zupp, Hannover-Hainholz.

865,338 (January 31, 1924). Specula syringe. Neumann & Cie., Cologne.

865,344 (February 1, 1924). Rubber bathing shoe. Paragummiwerk m. b. H., Köln-Deutz.

865,512 (January 21, 1924). Medical and dental injection syringe. Carl Schmenn, Fabrik chirurgischer Instrumente, Hamburg.

865,696 (February 1, 1924). Elastic tire. Sembusto Elastische Radbereifungen G. m. b. H., Vienna; represented by: L. Werner and E. Wurm, Berlin S. W. 11.

865,793 (January 23, 1924). Fabric belt with rubber band. Mechanische Trikotwarenfabriken C. F. Behr Wachfolger, Balingen, Württemberg.

865,940 (February 11, 1924). Cushion cycles, motorcycles and the like. Hannoversche Gummiwerke Excelsior, A.-G., Hannover-Limmer.

865,947 (December 15, 1922). Protective rubber clothing. Firma Carl Plaat, Köln-Nippes.

Austria

Published December 15, 1923

A.4027-22 Elastic tire. The Goodyear Tire and Rubber Co., Akron, Ohio.

France

Patents Issued With Dates of Issue

564,395 (March 7, 1923). Air chamber for automobile tires. A. C. Barrère.

564,402 (March 27, 1923). Casing for pneumatic tire. F. O. Muro.

564,448 (March 28, 1923). Tire that will not burst or collapse. M. J. C. André.

564,591 (July 18, 1922). Mask for protection against asphyxiating gases. Etablissements Hutchinson.

564,832 (March 29, 1923). Drains, sounds, tubes and solid cylinders with screw threads, of rubber or similar material. O. P. E. and R. P. Peyret.

565,174 (April 17, 1923). Casing for demountable pneumatic tire. L. Férard.

565,657 (April 30, 1923). Improvements in rubber tires. M. M. Dessau.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted March 18, 1924, Act of February 20, 1905

181,244 Representation of a section of a solid tire—solid tires of rubber or rubber and fabric. The Firestone Tire & Rubber Co., Akron, Ohio.

181,265 FUTURIST—heels for boots and shoes, made of rubber, fabric, leather, wood, compo, and combinations thereof. David Hill, Ltd., Leicester, England.

181,269 Within an oval outline and with lettering shaped to conform to the border the word PITTER-PATTER—children's and misses' shoes of leather, rubber, fabric and combinations of same. The Zane Shoe Co., Zanesville, Ohio.

181,294 DAISY—rubber fruit jar rings. Schacht Rubber Manufacturing Co., Huntington, Indiana.

181,339 In letters extending from top to bottom of a diamond shaped background the word SHOE and across this so as to break it at the center horizontally the words ST. LOUE ROKER—leather, rubber, fabric shoes. Quality Shoe Shop, Washington, D. C.

181,398 On a white background a small black cherub riding on a winged wheel and blowing a horn; quadrilateral border lines black and slightly arched; above this the word SCHACHT and below the design the word DAISY—Schacht Rubber Manufacturing Co., Huntington, Indiana.

181,480 MYSTO SPRAY-BATH, in shaded letters and with lines indicating shading extending obliquely below; the whole enclosed in rectangular border—bath sprays with rubber tubing attachment. W. S. Grant Co., New York, N. Y.

181,504 SEAF—golf balls. John Wanamaker, New York.

Granted March 18, 1924, Act of March 19, 1920, Section 1(b)

181,533 DADDY BROWNELL—pneumatic tires and rubber tires and tubes. The Wildman Rubber Co., Bay City, Michigan.

181,536 SHOOR-TRED SHOE on a rectangular background, the whole enclosed in a border oval except at the bottom, where it ends in a straight line—shoes of leather, felt, canvas, rubber, for men, women and children. A. H. Geuting Co., Philadelphia, Pennsylvania.

181,537 NON-BETTER, describing a semi-circle over a bunch of roses—elastic braids, cords and loops; other fancy goods and notions. Budlong Manufacturing Co., Auburn, Rhode Island.

Granted March 25, 1924, Act of February 20, 1905

181,656 GASPAC, a stroke of the G underscoring the remaining letters—inner tubes. Ajax Rubber Co., Inc., Millbrook, New York.

181,666 PARKERITE, in letters formed from a representation of covered wire—rubber covered electric wire cables. Seward Wire Co., Parkersburg, West Virginia.

181,736 SENTINEL—inner tubes, pneumatic, cord, and fabric tires. The Columbia Tire & Rubber Co., Mansfield, Ohio.

Granted March 25, 1924, Act of March 19, 1920, Section 1(b)

181,840 INDESTRUCTIBLE—belting, hose, and packing of rubber and fabric. New York Belting & Packing Co., New York, N. Y.

181,889 MIAMI CORD—rubber tires. The Master Tire & Rubber Co., Dayton, Ohio.

Granted April 1, 1924, Act of February 20, 1905

181,904 NEW AIR STEP—rubber heels. Pasquale Altruda, Providence, Rhode Island.

181,952 MIAMI—rubber and fabric belting. New York Belting & Packing Co., New York, N. Y.

181,971 PARACORD—rubber soles and heels. Endicott Johnson Corporation, Endicott, New York.

182,009 ROAMER—rubber heels. Laing, Harrar & Chamberlin, Philadelphia, Pennsylvania.

182,020 Within an equilateral triangle, lined to represent shading, representation of a crescent moon, the face smiling upon a shoe resting upon the crescent tip; above this the words EVERBEST ONE-PIECE SHOE CO.—shoes of leather and combinations of leather and fabric, leather and rubber, and leather, fabric and rubber. Everbest One-Piece Shoe Co., Boston and Wellesley, Massachusetts.

182,044 At the center of a circle within a circle the letter H, and within the annular space provided by the two circumferences the words HARGREAVES CORD—pneumatic tires of rubber and fabric, including cord fabric. Hargreaves, Inc., Detroit, Michigan.

182,048 FOOT GUIDE—rubber heels and lifts for heels, made of rubber or analogous material. Joseph Pietzuch, Cincinnati, Ohio.

182,049 KURE X ARCH—shoes of leather and fabric with or without rubber heels, and canvas shoes with or without rubber soles and heels. Melansn Shoe Co., Lynn, Massachusetts.

182,147 Representation of a knot of blue ribbon, and the words BLUE RIBBON—sanitary napkins. Muriel Miller, trading as The Merle Napkin Co., Denver, Colorado.

182,200 HEXAGON; individual arrangement—automobile and truck rubber and rubber and fabric tires and inner tubes. Hexagon Tire Co., Inc., New York, N. Y.

182,194 GOLD-BOND—inner tubes. The Better Tires Co., Chicago, Illinois.

Granted April 1, 1924, Act of March 19, 1920, Section 1(b)

182,230 HIKER, on an oval background within a larger oval—shoes of leather, rubber, fabric, or any combination of these. Remy-Landsberg Shoe Co., Philadelphia, Pennsylvania.

182,233 KOLER—rubber shoes. Lambertville Rubber Co., Lambertville, New Jersey.

182,241 NEVER RIP—garters. A. M. Malouf, New York, N. Y.

182,242 FIT FOR EVERYBODY—leather, fabric and rubber gloves. Jacob Adler & Co., Inc., New York, N. Y.

Granted April 8, 1924, Act of February 20, 1905

182,264 RELEEF—repair outfit for flexible rubber goods. R. W. Fox, trading as Releef Products Co., Birmingham, Alabama.

182,280 INTERSTATE—pneumatic tires. The Victor Rubber Co., Maitland, Springfield, Ohio.

182,313 The words SCHACHT SUPER TREAD on an oval background surrounded by a wreath with a simulation of a bow of ribbon at the top—rubber heels. Schacht Rubber Mfg. Co., Huntington, Indiana.

182,324 ARCH FORM, the words arranged one above the other—rubber heels. Thomas G. Plant Co., Boston, Massachusetts.

182,335 BIG FOUR—rubber heels. Melville Shoe Corporation, New York, N. Y.

Granted April 8, 1924, Act of March 19, 1920, Section 1(b)

182,517 CHEMICAL TIRE GRIP, in special arrangement and design—tire patches. Insectol Chemical Co., Inc., Greenwood, Mississippi.

182,539 SHIPLEY—pneumatic tires, inner tubes, and seal-healing liners. National Consolidated Rubber Co., San Francisco, California.

The United Kingdom

Published March 5, 1924

432,662 McGregor—football bladders. William Shillcock, 63-65 Newtown Row, Birmingham.

432,663 McGregor—footballs. William Shillcock, 63-65 Newtown Row, Birmingham.

435,800 Artex—art paper containing rubber latex. Samuel Jones & Co., Ltd., 7 Bridewell Place, London, E. C. 4.

442,403 Onito—machinery driving belting included in Class 40. J. & W. Tinto, Ltd., Drumoyne Works, 161 Shieldhall Road, Govan, Glasgow.

443,085 Lucky Garter—ladies' garters. Alma Woodward, trading as Alma Products Co., 1476 Broadway, New York, N. Y., U. S. A.

443,086 Lucky-Love Garter—ladies' garters. Alma Woodward, trading as Alma Products Co., 1476 Broadway, New York, N. Y., U. S. A.

443,088 Luck-in-Love garter—ladies' garter. Alma Woodward, trading as Alma Products Co., 1476 Broadway, New York, N. Y., U. S. A.

444,155 Joy-Ped—rubber pads for heels and soles. Phillips' Patents, Ltd., 142-146 Old street, London, E. C. 1.

444,355 Representation of a golf ball—all goods in Class 40 except tobacco pouches and the like. Blakey's Boot Protectors, Ltd., Armley Malleable Ironworks, Modder Place, Armley, Leeds.

444,482 Harlequin—balls for games. The Beldam Packing & Rubber Co., Ltd., 29 Gracechurch street, London, E. C. 3.

Published March 12, 1924

443,472 Within a circle the word Brod-Feet, and beneath it in script the name Thornton & Co.—boots, shoes, and slippers. Thornton & Co., Ltd., 78 Princes street, Edinburgh, Scotland.

444,995 Ray—rubber soles and heels. Hull & Mellor, Cooper street, Hyde, Cheshire.

Published March 19, 1924

444,150 Tapoleum—rubber floor covering of the nature of floor cloth. Garden City Rubber Co., Works Road, Letchworth, Hertfordshire.

Published March 26, 1924

437,167 Fakir—goods of rubber or gutta percha exclusively in Class 40. Pirelli & Co., Milan, Italy. For Service in the United Kingdom: L. N. Reddie, 1 Furnival street, Holborn, London, E. C. 4.

439,194 The White Spot, so arranged that the word WHITE is in black letters on a white circular background, breaking a black parallelogram containing the other two words in white letters—rubber tobacco pouches. Alfred Dunhill, Ltd., 137-143 High street, Notting Hill Gate, London, W. 11.

441,251 Supervule—outfits included in Class 50 for repairing tires, tubes, and similar goods. The Wayne V. Meyers Co., Ltd., 14-17 Holborn Viaduct, London, E. C. 1.

B443,745 Within a rectangular border, at the center, the representation of a duck, with dotted lines indicating rain; surrounding this a double ruled circular outline with a buckle like that of a belt; within the annular space provided the words SUITABLE FOR ALL CLIMATES; above this the words AYLESBURY RAINCOATS and beneath it the words GUARANTEED WATERPROOF—raincoats. John Ross, 80 Buchanan street, Glasgow, Scotland.

444,223 Trebeisa—rubber gloves and aprons for surgical use. Anthony Seibert, 6 Fann street, London, E. C. 1.

444,224 Trebeisa—rubber gloves and aprons in Class 40. Anthony Seibert, 6 Fann street, London, E. C. 1.

444,832 Cebedene—waterproof coats. Curzon Brothers, Ltd., 45-53 Leonard street, London, E. C. 2.

445,598 Midral—goods of rubber or gutta percha exclusively in Class 40. James George Savagar, 43 Brompton Road, London, S. W. 3.

Published April 2, 1924

435,127 Ceymal—goods of rubber or gutta percha exclusively in Class 40. Duro Rubber Products, Ltd., 58 Newman street, Oxford street, London, W. 1.

441,591 Representation of a bird in flight, and on its back a ball having the imprint MARTIN; above this in black letters describing a semicircle the word MARTIN—golf balls. Martins-Birmingham, Ltd., New Works, Granville street, Birmingham.

444,464 Bec-late—electric insulating material composed chiefly of ebonite. The British Ebonite Co., Ltd., 25 Nightingale Road, Hanwell, London, W., 7.

Dominion of Canada

Registered

35,128 FLEXICORD—tire liners, blowout shoes, valve stem patches, repair patches, belts and belting, hose and tubing, heels and soles, horseshoe pads, golf balls, floor tiling, tar rings, crutch tips, and other goods of rubber or rubber composition or substitutes. Dunlop Tire & Rubber Co., Ltd., Toronto, Ontario.

35,165 Belting; green band running longitudinally of the belt. Gutta Percha & Rubber Ltd., Toronto, Ontario.

35,171 KITCHENER—suspenders, garters, sleeve bands. The Kitchener Suspender Co., Ltd., Kitchener, Ontario.

New Zealand

Registered

18,764 HIBOUNCER, in script on a five-pointed star—rubber and sponge balls. H. L. Hayman, 3 Coleman street, London, E. C. 2, England, trading as P. Hayman & Co., Victoria street, Wellington, New Zealand.

20,598 WEDGE TREAD, distinctive lettering and design—tires and tubes. Miller Rubber Co., Akron, Ohio, U. S. A.

20,800 The letter F on a shield—rubber tires and tubes; rubber impregnated tire-building fabrics; tire accessories. The Firestone Tire & Rubber Co., Akron, Ohio, U. S. A.

Designs

The United States

Issued* March 25, 1924

64,318 Tire. Term 14 years. A. D. Mathys, Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts.

64,327 Tire tread. Term 3½ years. C. E. A. Spiegel, New York, N. Y.

Issued* April 1, 1924

64,352 Tire. Term 14 years. A. Hargraves, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

Issued* April 8, 1924

64,398 Tire. Term 14 years. R. Craft, Portland, Oregon.

64,401 Tire tread. Term 3½ years. A. M. Elliott, Oakland, California.

64,402 Solid tire. Term 14 years. Fred D. Fowler, assignor to Hood Rubber Co., both of Watertown, Massachusetts.

64,403 Solid tire. Term 14 years. Fred D. Fowler, assignor to Hood Rubber Co., both of Watertown, Massachusetts.

64,415 Tire. Term 14 years. J. Hauvette Michelin, New Brunswick, New Jersey.

64,416 Tire. Term 3½ years. J. F. Miller, Minden, Louisiana.

64,423 Tire tread. Term 3½ years. L. A. Subers, Lakewood, Ohio.

64,424 Tire tread. Term 3½ years. L. A. Subers, Lakewood, Ohio.

64,425 Tire tread. Term 3½ years. L. A. Subers, Lakewood, Ohio.

64,426 Tire tread. Term 3½ years. L. A. Subers, Lakewood, Ohio.

64,427 Tire tread. Term 3½ years. L. A. Subers, Lakewood, Ohio.

64,431 Tire tread. Term 14 years. H. Willshaw, assignor to Dunlop Tire & Rubber Co., both of Buffalo, New York.

64,318 64,327 64,352 64,365, 64,376 64,378 64,394 64,398 64,401 64,402 64,403 64,415 64,416 64,423 64,424 64,425 64,426 64,427 64,431 64,432 64,433

64,365 Tire. Term 7 years. F. Law, Oakville, Ontario, Canada.

64,376 Pneumatic Tire. Term 14 years. E. M. Sears, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

64,432 Tire tread. Term 14 years. H. Willshaw, assignor to Dunlop Tire & Rubber Co., both of Buffalo, New York.

64,433 Tire. Term 7 years. J. J. Wisniowski, Chicopee, Massachusetts.

World Tire Production and Export Trade

By E. G. Holt[1]

THE principal tire manufacturing countries of the world produced during 1923 a total of 54,520,000 casings for motor cars and motorcycles, the output of the United States in this trade being approximately 46,000,000. It should be noted that the United States has 80 per cent of the world's automobiles within its borders, the supplying of this market rendering the American tire industry practically independent of that of foreign countries.

The United States having this large percentage of motor vehicles, there being more than 13,200,000 passenger automobiles in the United States as compared with about 2,280,000 for the rest of the world, the American tire market is mainly confined to this country. The number of automobile casings shipped abroad in 1923 represented only about 3 per cent of this country's production, although the number of tires, estimated at 1,362,741, represented 29.4 per cent of the world's trade in such commodities. In 1922, with exports of 1,325,753 casings, the United States trade had represented 33.5 per cent. The total exports of automobile and motorcycle casings from the leading tire manufacturing countries of the world has been estimated at 4,638,000 in 1923, as compared with 3,961,000 in 1922.

As contrasted with the American tire industry with its 1923 production of 46,000,000 casings and exports of 1,362,741, foreign manufacturers are estimated to have produced 8,520,000 casings for motor cars and motorcycles during 1923, and to have exported 3,275,000, or 38 per cent of them. France was dependent on export markets for the disposal of 50 per cent of her production; Italy nearly 75 per cent; Great Britain 21.5 per cent; Germany 36 per cent; and Canada 28.6 per cent. In view of the fact that foreign manufacturers are using every effort to retain a trade which means so much to them, tire prices in some export markets have been reduced to levels even below those in the United States. When it is considered that American manufacturers have to meet the low prices of competitors in export markets and in addition have often to pay greater transportation charges and heavier customs duties than competitors in shipping to the best markets, it is surprising that the American exports constituted so large a portion of the world export trade as was the case in 1923.

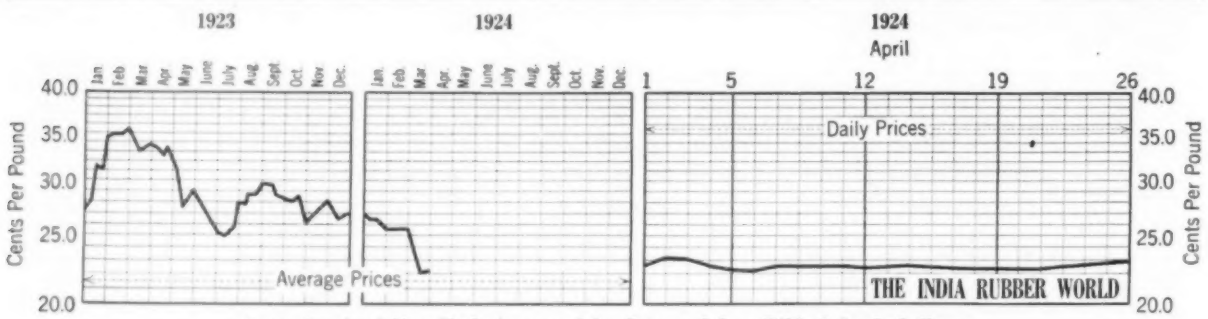
French manufacturers are the chief competitors of Americans in the export tire trade. They supplied approximately 30 per cent of the total volume of exports in 1923, with shipments of about 1,400,000 casings. The dominating firm in the French export trade, Michelin & Cie., exports from both its home factory in Clermont-Ferrand and its Italian factory at Turin. American manufacturers export both from their United States and Canadian factories. The Italian and French tire exports combined were about equal in volume to the United States and Canadian exports. These four countries together accounted for 80 per cent of the export tire business in 1923.

EXPORTS, PRODUCTION AND PRODUCTION CAPACITY, OF CASINGS FOR MOTOR CARS AND MOTORCYCLES, ESTIMATED FOR PRINCIPAL FOREIGN MANUFACTURING COUNTRIES

	1922 Exports	1923 Exports	1923 Production	1923 Production Capacity
	Number	Number	Number	Number
France	1,125,000	1,400,000	2,800,000	3,500,000
Italy	345,000	450,000	650,000	850,000
Canada	375,000	500,000	1,750,000	2,500,000
Great Britain	343,000	430,000	2,000,000	3,500,000
Germany	192,000	250,000	700,000	1,200,000
Japan	160,000	130,000	200,000	250,000
Belgium	36,000	75,000	120,000	225,000
Australia	35,000	25,000	250,000	400,000
Austria	24,000	15,000	50,000	75,000
Total—Foreign	2,635,000	3,275,000	8,520,000	12,500,000
United States	1,326,000	1,363,000	46,000,000	.....
Total for world	3,961,000	4,638,000	54,520,000	.....

In estimating the 1923 production capacity consideration was given to the relative activity of the tire industries in the various countries, to the general economic conditions in each country, and to the seasonal nature of the tire trade in Canada. A comparison of the estimated production and the production capacity will show that the French industry is estimated to have produced at 80 per cent of capacity in 1923, while British manufacturers were producing at approximately 57 per cent, etc. While it is intended to show the relative activity of the tire industries in the various countries rather than the actual production capacity, it is believed that the estimates are conservative and that the production capacity of foreign tire manufacturers would total at least 12,500,000 tires per year.

[1] Rubber Division, United States Department of Commerce.



Ratio Graph of New York Average Sales Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE market for crude rubber during the past month has been uniformly dull and without activity on the part of both dealers and consumers. The latter continue to purchase for their current needs only and are not much interested beyond June deliveries. Under these conditions prices have continued at the low levels reached in March, spot ribs ranging between 22⅛ and 23¼ cents, holding steady at 22⅜ to 22½ cents.

An advance of spot to 23⅛ cents early in the month reflected a corresponding rise in London. It elicited no interest and receded promptly to 22½ cents. Practically this level ruled firm for spot ribs from the fourth to the twenty-third of the month. Some scattered factory buying interest developed for nearby rubber.

Immediately after Easter spot rubber rose to 23⅛ cents, on April 24, in sympathy with a London advance. The movement of the market was in response to the higher sterling price rather than to any increase in demand for rubber. Ribbed smoked sheets for May-June delivery ranged from 22⅞ to 23 cents on April 1, and 23¼ to 23⅜ cents on April 24. On April 1, July-September rubber was quoted 22½ to 22⅝ cents, and on April 24, 23¼ cents, while October-December was 23 to 23¼ and 24¼ cents on those days.

London cables indicate that rubber in that market will be well controlled at the end of April when the Stevenson Committee meets to set a new exportable allowance percentage to replace the present 60 per cent rate.

During the first quarter of 1924 the United States imported 16,245 tons less of plantation rubber than for the same period in 1923. Crude rubber authorities estimate that the present stock of crude rubber in the United States does not exceed normal requirements for two months' consumption. London stocks are also moderate. The close balance thus indicated results from the months of conservative buying on the part of consumers. A pronounced change in that policy would be promptly reflected in advanced prices.

Upriver Fine Pará was quoted early in the month steady at 18½ cents, and becoming firmer at 19½ cents on April 24.

Importations of all grades during March, 1924, were 17,752 tons, compared with 33,916 tons one year ago. Plantation arrivals for March, 1924, were 16,009 tons, compared with 31,673 tons one year ago. Total importations of all grades for the three months ended March 31 were 71,126 tons, compared with 89,333 tons for the corresponding period of last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATION. April 1. Spot first latex crêpe, 22⅞-23 cents; Apr. 23⅛-23¼ cents; May-June, 23¼-23⅜ cents; July-Sept., 23½-23⅝ cents; Oct.-Dec., 23¾-24 cents.

April 25. Spot first latex crêpe, 24 cents; May-June, 24 cents; July-Sept., 24¼ cents; Oct.-Dec., 24½ cents.

April 1. Spot ribbed smoked sheets, 22⅝-22¾ cents; Apr. 22⅜-22½ cents; May-June, 22⅞-23 cents; July-Sept., 23⅜-23½ cents; Oct.-Dec., 23⅝-23¾ cents.

April 25. Spot ribbed smoked sheets, 23 cents; May-June, 23 cents; July-Sept., 23⅝ cents; Oct.-Dec., 24 cents.

April 1. Spot No. 1 amber crêpe, 22¾-22⅞ cents; Apr. 22¾-22⅞ cents; May-June, 23 cents; July-Sept., 23⅛-23¼ cents; Oct.-Dec., 23½-23⅝ cents.

April 25. Spot No. 2 amber crêpe, 22¾ cents; May-June, 22¾ cents; July-Sept., 22¾ cents.

April 1. Spot No. 1 rolled brown crêpe, 22¼ cents; Apr., 22¼ cents; May-June, 22 cents; July-Sept., 22⅛-22¼ cents; Oct-Dec., 22⅜-22½ cents.

April 25. Spot No. 1 rolled brown crêpe, 21⅝ cents; May-June, 21⅝ cents; July-Sept., 22 cents.

SOUTH AMERICAN PARAS AND CAUCHO. April 1. Spot, upriver fine, 19 cents; islands fine, 16 cents; upriver coarse, 16½ cents; islands coarse, 9½ cents; Cametá, 11¼-11½ cents; caucho ball, 17 cents.

April 25. Spot, upriver fine, 20¾ cents; islands fine, 16½-17 cents; upriver coarse, 16-16¼ cents; Cametá, 12 cents; caucho ball, 15¾-16¾ cents.

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

PLANTATIONS	March, 1924													April, 1924									
	17	18	19	20	21	22	24	25	26	27	28	29	31	1	2	3	4	5	7	8	9	10	11	12
Sheet																								
Ribbed smoked	21	21¼	22½	22	21¾	21⅞	22⅜	22⅜	21¾	21⅞	21⅞	22	22	22½	22⅞	22⅛	22	22⅛	22⅜	22⅜	22¼	22¼	22¼	22¼
Crêpe																								
First latex	21⅜	22	22⅝	22¼	22⅛	22¼	22½	22⅝	22¼	22¼	22½	22⅜	22⅝	23	23¼	22⅞	22½	22½	22¾	22⅝	23¼	22¾	22¾	22¾
Off latex	21	21⅞	22⅛	22⅛	21¾	22	22¼	22⅜	21¾	22	22	22	22¼	22¼	23⅛	22⅛	22⅛	22¼	22⅜	22¼	22¼	22⅜	22¼	22¼
No. 1 blanket	....	....	....	22⅜	....	....	....	22½	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
No. 2 blanket	20⅜	21⅝	22⅛	22⅛	22	21⅞	22⅛	22	22	22	22¼	22¼	22	22¼	22⅝	22¼	22	22⅛	22⅛	22⅛	22	22⅛	21⅞	21⅞
No. 3 blanket	20½	21½	21⅜	21⅜	21¾	21⅝	22	21⅞	21¾	21¾	22¼	21⅞	21⅝	22	22¼	22¼	21⅞	22	22	22	21⅞	22	21¾	21¾
Thin, clean brown	20½	21¼	21⅝	21½	21⅝	21⅝	21⅞	21⅞	21⅝	21¾	21⅝	21⅝	21⅝	21⅞	22¼	22⅛	21¾	21⅞	21⅞	22	21⅞	21⅞	21¾	21¾
Specky brown	20	20¾	21¼	20⅞	21½	21½	21½	21⅜	21⅛	21¼	21¼	21¾	21¼	21⅛	21⅞	21¾	21½	21½	21½	21⅝	21⅝	21⅝	21½	21½
Rolled brown	20¾	21⅛	21¾	21¾	21¾	21¾	21⅞	21⅞	21⅜	21⅞	21⅞	21¾	21⅞	22½	23¾	22⅛	22⅛	22	22	21⅞	21⅞	21⅞	21¾	21¾

New York Quotations

Following are the New York spot rubber quotations per pound, for one year, one month ago, and April 25, the current date:

Plantation Hevea	April 25, 1923	March 25, 1924	April 25, 1924
LATEX			
Rubber latex (Hevea)	$1.25 @$1.35	*per gal.* $1.30@	*per gal.* $1.30@
CREPE			
First latex	.32¼@.32¾	.22¾@.23	.24 @
Off latex	.32 @.32¼	.22½@.22¾	.23¾@
Amber No. 1	.31½@.31¾	@	@
Amber No. 2	.31¼@.31½	.22 @.22¼	.22¾@
Amber No. 3	.31 @.31¼	.22 @	.22½@
Brown, clean, thin	.31¼@.31½	.22 @	.22½@
Brown, specky	.30½@	.21¼@.21¾	.21½@
Brown, rolled	.29 @	.21¾@.22	.21⅝@
SHEET			
Smoked, ribbed	.31¾@.32	.22¼@.22½	.23 @
Smoked, plain	.31¼@	@	@
Unsmoked	.30¾@	@	@
East Indian			
PONTIANAK			
Banjermassin	.08 @	.06¼@.07½	.07¼@
Palembang	@	.07¾@	.07½@
Pressed block	.13½@	.13¼@.13¾	.13 @
Sarawak	.09½@	.07 @	.07 @
South American			
PARAS			
Upriver, fine	.28½@.28¾	.18½@	.20¾@
Upriver, fine	*.40 @	*.28½@	*.29 @
Upriver, medium	.26¾@.27	.17 @.17¼	.18 @
Upriver, coarse	.25½@.26	.15½@.16	.16 @.16¼
Upriver, coarse	*.37 @	*.25¾@	*.25 @
Islands, fine	.27½@	.16 @.17	.16½@.17
Islands, medium	.26½@	@	.17¼@
Islands, coarse	.14¾@	.10½@	.11½@
Cametá	.15⅛@	†.11½@.12	.12 @
Acre Bolivian, fine	.28½@.29	.19 @.19¾	.20¾@
Acre Bolivian, fine	*.40½@	*.28½@.29	*.29 @
Beni Bolivian	.29 @	.19¼@.19½	.20¾@
Madeira, fine	.28½@.29	.19½@	.21½@
Peruvian, fine	.27¼@	.17 @.17¾	.19¾@
Tapajos, fine	.27 ¼@	.17½@.17¾	.19 @.19¾
CAUCHO			
Upper caucho ball	.27½@	.16½@.16¾	@
Upper caucho ball	*.37½@	*.26 @	*.26 @
Lower caucho ball	.26½@	.15¾@.16	@
Maniçobas			
Ceará negro heads	.23 @	.20 @	.19 @
Ceará scrap	.09 @	.08 @	.08 @
Maniçoba 30% guaranty	.20 @	.18 @	.16 @
Mangabeira, thin sheet	.26 @	.23 @	.21 @
Centrals			
Central scrap	.23¼@.24	.16½@	.16 @
Central wet sheet	.14 @.16	.14 @	.14 @
Corinto scrap	.23¼@.24½	.16½@	.16 @
Esmeralda sausage	.23¾@.24½	.16½@	.16 @
Guayule washed and dried	.28 @	.23½@	.24 @
Africans			
Benguela, No. 1, 28½%-	.18 @	.17 @	.16 @
Benguela, No. 2, 32½%-	.15 @	.13 @	.12 @
Congo prime, black upper	.28 @	.19 @	.19 @
Congo prime, red upper	.27 @	.20 @	.20 @
Kassai, black	.28 @	.19 @	.18 @
Kassai, red	.27 @	.20 @	.19 @
Gutta Percha			
Gutta Siak	.19¼@	.17¾@	.16 @.17
Gutta Soh	@	.32 @	.29 @
Red Macassar	3.00 @	3.00 @	3.00 @
Balata			
Block, Ciudad Bolivar	.73 @	.66 @	.65 @.66
Colombia	.61 @	.57 @	.59 @.60
Panama	.60 @	.56 @	.59 @.60
Surinam, sheet	.83 @	.73 @	.74 @
amber	.88 @	.76 @	.76 @
Chicle			
Colombia	.25 @.30	†.30 @	†.31 @
Honduras	.62 @	†.65 @	†.64 @.65
Venezuela	.63 @	†.65 @.66	†.66 @
Yucatan, fine	.65 @	†.67 @.68	†.67 @.67½

*Washed and dried crêpe. Shipment from Brazil.
†Nominal.

London

The influences that controlled the London crude rubber market were essentially those reflected in the New York market. The advance of a half penny a pound on April 2 to 13 pence developed considerable strength on a report that British interests in Malaya will soon announce the formation of a selling syndicate for the purpose of regulating the sterling price. The price promptly fell within a couple of days and maintained an average level of 12½ pence till the Easter holidays.

A favorable statistical position developed during the holidays and the sharp reduction in the weekly stock report combined for a steady market after Easter, although American buying interest was not strong. A very firm market was reported April 23 at 13 pence a pound for spot, and an advance of ⅜ pence a pound in all positions as the result of good buying interest and scarcity of offerings.

Reported London stocks decreased 1,063 tons between March 31 and April 22. The weekly stocks were as follows: March 31, 55,473 tons; April 8, 55,134 tons; April 15, 55,274 tons; April 22, 54,367 tons.

Comparative Low and High New York Spot Rubber Prices

	April		
	1924*	1923	1922
PLANTATIONS			
First latex crêpe	$0.22¾@$0.24	$0.31¼@$0.34½	$0.14¾@$0.16¾
Smoked sheet, ribbed	.22 @ .23⅛	.31¼@ .34½	.14¾@ .16¾
PARAS			
Upriver, fine	.19 @ .21	.28½@ .30¾	.17¼@ .19¼
Upriver, coarse	.16 @ .17½	.26½@ .28½	.12 @ .14
Islands, fine	.16 @ .17	.26¼@ .29	.16 @ .18¼
Islands, coarse	.09¼@ .11¾	.15 @ .22	.07½@ .09¾
Cametá	.11¼@ .12	.15 @ .17	.09 @ .10

*Figured to April 25, 1924.

Reclaimed Rubber

Business in reclaimed rubber for the first quarter of the year was satisfactory in volume, particularly during January and February. In March the demand for reclaims lessened somewhat. In April consumers' requirements continued fair in amount and strictly confined to current needs. The outlets for reclaim offered by insulated wire, garden hose and jar ring manufacture as well as belting and mechanical specialties are consuming their customary seasonal tonnage.

Consumers are convinced of the production value of reclaims as plasticators in compounding, due to the mill drainage they experienced when attempting to discard reclaims for cheap rubber over-mineralized. Reclaims today, more than ever before, are rated for their technical and production value and their relative value is figured on volume cost rather than a pound basis.

April quotations show a distinctly downward tendency in nearly every grade listed which enhances their volume cost values over a month ago while correspondingly reducing the reclaimers' margin.

New York Quotations

April 25, 1924

Auto Tire		
Black	*lb.*	$0.08¼@$0.09
Black, washed	*lb.*	.10¾@ .11
Dark gray	*lb.*	.09¾@ .10
Light gray	*lb.*	.11 @ .11¼
White	*lb.*	.15 @ .16
Shoe		
Unwashed	*lb.*	.09½@ .09¾
Washed	*lb.*	.12¾@ .13
Tube		
No. 1	*lb.*	.14 @ .14½
No. 2	*lb.*	.10½@ .11
Uncured Tire Friction		
No. 1	*lb.*	.21 @ .22
No. 2	*lb.*	.16 @ .17

Miscellaneous			
High grade red	lb.	$0.13 @	$0.13½
High tensile, black	lb.	.15½ @	.15¾
Mechanical blends	lb.	.05 @	.06
Truck tire	lb.	.08 @	.08¼

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	February, 1923		February, 1924	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—free				
Crude rubber				
From France	66,896	$19,714	209,520	$46,769
Netherlands	717,318	282,202	117,327	28,432
Portugal	10,748	784	.....	.....
United Kingdom	4,265,531	1,233,994	9,675,341	2,519,404
Canada	740	236	430	126
Central America	.....	.....	977	151
Mexico	.....	.....	.....	.....
Brazil	4,196,475	938,955	2,852,699	523,044
Peru	212,443	40,908	14,165	3,416
Other So. America	173,828	43,477	355,726	61,592
British E. Indies	42,703,713	8,805,025	44,524,825	10,877,253
Dutch E. Indies	6,003,996	1,365,235	12,636,082	3,305,647
Other countries	2,027,602	420,293	201,603	278,340
Totals	60,379,290	$13,150,823	70,588,695	$17,644,164
Balata	219,022	105,969	93,578	56,160
Jelutong (Pontianak)	657,047	48,555	1,039,433	85,423
Gutta percha	78,575	16,179	450,376	56,577
Rubber scrap	1,923,972	80,068	1,119,904	36,636
Totals, unmanufactured	63,257,906	$13,401,614	73,642,986	$17,878,960
Chicle	833,009	400,663	333,704	166,052
MANUFACTURED—dutiable				
Rubber belting	23,114	25,401	56,423	41,385
Other manufactures of substitutes for rubber	.....	55,336	.....	154,072

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	486,005	$44,544	790,876	$91,591
Scrap and old	666,033	24,410	966,146	38,929
Footwear				
Boots ..... pairs	27,626	74,252	52,108	103,809
Shoes ..... pairs	50,509	38,934	88,986	71,447
Canvas shoes with rubber soles ..... pairs	365,126	277,496	318,216	257,386
Druggists' rubber sundries	85,584	85,291	.....	.....
Water bottles and fountain syringes	.....	.....	22,344	17,050
Other druggists' rubber sundries	.....	.....	65,927	73,638
Bathing caps	.....	.....	24,303	54,570
Hard rubber goods				
Battery jars and accessories	26,722	11,164	38,608	15,207
Other electrical supplies	27,324	6,122	10,831	6,163
Other hard rubber goods	22,490	20,590	17,705	19,766
Tires				
Pneumatic casings				
For automobiles	131,586	1,532,309	89,448	1,043,452
Others	10,251	42,983	2,435	9,957
Pneumatic tubes				
For automobiles	81,279	134,192	94,222	166,008
Others	3,084	3,062	3,939	3,078
Solid tires				
For automobiles and motor trucks	7,909	190,101	9,424	240,283
Others	63,160	15,942	86,182	21,478
All other tires	.....	.....	.....	.....
Tire repair materials	50,862	18,916	95,446	34,208
Belting	217,984	115,279	259,505	151,601
Hose	341,251	118,435	352,305	140,092
Packing	91,631	43,758	123,657	47,146
Soles and heels	116,362	44,085	135,739	49,437
Thread	68,085	79,422	91,819	99,475
Other rubber manufactures	358,702	220,419	380,950	203,867
Totals, manufactured	.....	$3,141,706	.....	$2,959,578

Exports of Foreign Merchandise

UNMANUFACTURED				
India rubber	1,942,433	$588,646	1,642,517	$425,728
Balata	14,494	10,411	34,177	16,912
Jelutong (Pontianak)	.....	.....	.....	.....
Totals, unmanufactured	1,956,927	$599,057	1,676,694	$442,640
MANUFACTURED				
Gutta percha and india rubber	2,175	435	.....	.....
India rubber substitutes	1,020	1,196	282	378
Totals, manufactured	3,195	$1,631	.....	.....

Details of exports of domestic merchandise by countries during February, 1924, appear on pages 562-565 of this issue.

The Market for Rubber Scrap

New York

Price levels on practically all grades of rubber scrap have receded noticeably, and are really dragging on the bottom but would quickly turn upward on the appearance of orders indicating buying interest of moderate tonnages. Reclaimers are not seeking supplies, although maintaining steadily a fair output. One rubber scrap factor refers to the business as "a thing of the past." While a waiting situation rules in the scrap market, dealers are not without hope of ultimate revival of reclaimers' interest.

BOOTS AND SHOES. Business has been of small volume and prices are lower. The situation as regards quotations remains more or less nominal, with practically no bidding or orders.

TIRES. Demand for tires has very much slowed down and prices are unchanged from last month at $13.00 to $14.00, with business practically at a stand-still.

INNER TUBES. Tube scrap has been moving very slowly at prices lower and easier than a month ago. On No. 1 and No. 2 grades consumers' quotations have dropped a quarter of a cent. Mixed tubes are in less demand.

All other grades of rubber scrap are without interest at purely nominal prices.

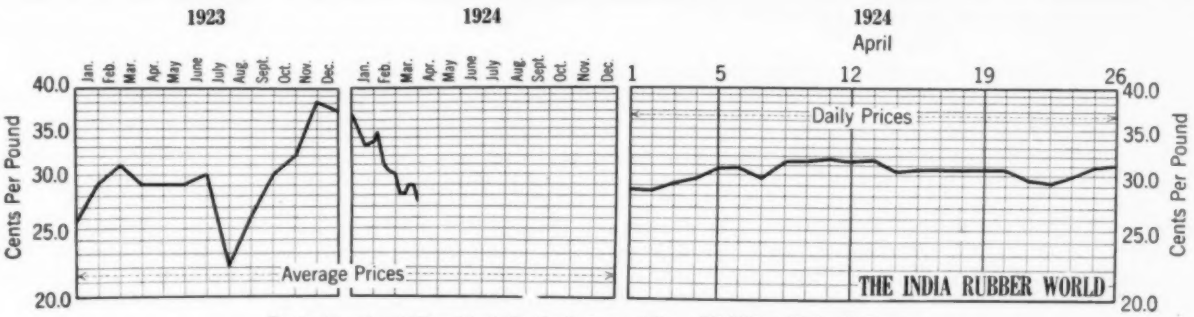
Consumers' Quotations for Carload Lots Delivered

April 25, 1924

Boots and Shoes			
Boots and shoes, black	lb.	$0.02½ @	$0.02⅝
Trimmed arctics	lb.	.01¾ @	.01⅞
Untrimmed arctics	lb.	.01¼ @	.01⅜
Hard Rubber			
Battery jars, black compound	lb.	.01 @	.01¼
No. 1 scrap	lb.	.06 @	.07
Inner Tubes			
No. 1	lb.	.03¾ @	.04
No. 2	lb.	.02½ @	.02¾
Red	lb.	.02⅜ @	.02⅝
Mechanicals			
Black scrap, mixed	lb.	.00¾ @	—
Heels	lb.	.00½ @	—
Horse-shoe pads	lb.	.01 @	—
Hose, air brake	ton	14.00 @	16.00
regular	ton	11.00 @	13.00
Red, scrap, mixed	lb.	.01½ @	.01¾
White, scrap, mixed	lb.	.01½ @	.01¾
Tires			
PNEUMATIC			
Auto peelings	lb.	.01 @	.01¼
Bicycle	ton	10.00 @	12.00
Standard white auto	ton	28.00 @	32.00
Mixed auto	ton	13.00 @	14.00
Stripped, unguaranteed	ton	10.50 @	11.00
SOLID			
Carriage	ton	20.00 @	25.00
Irony	ton	10.00 @	15.00
Truck, clean	ton	20.00 @	25.00

BALLOONS USED IN ATMOSPHERIC TESTS

Unique in the annals of meteorology will be a proposed investigation of the atmosphere, which will be undertaken at Scott Field, Illinois, by the United States Weather Bureau in cooperation with the United States Army Air Service. The balloons used in making the ascents will be of the usual army spherical type, 35,000 cubic feet capacity, and constructed of two-ply rubberized cotton fabric.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. The decline of spot middling upland cotton on March 31 reached 27.70 cents, the lowest so far this year. On April 1 it advanced to 28.60 cents and continued upward to 31 cents on April 25.

Cotton has continued to move out of the country and into home consumption at a rate which threatens to deplete the available supply before the end of the season if curtailment does not soon become more drastic. There has been a steady decrease in domestic mill consumption in the past three months. Increased falling off in mill consumption abroad is doubtful.

The first of the weekly reports of the U. S. Weather Bureau indicate that crop preparations were making fairly good progress.

ARIZONA COTTON. There is a fair current demand for the higher grades of Pima and but very little of these qualities available. Prices range from 40 to 43 cents according to grade.

EGYPTIAN COTTON. The situation of the market in Egyptian cotton offers no new features. Medium Sakels are worth between 43 and 44 cents and Medium Uppers only one-half cent less. Reports from Alexandria indicate that buying in the spot market continues. As long as cotton is passing from growers' into consumers' hands in satisfactory volume there is little likelihood of lower prices.

Prices of Medium Sakellaridis and Medium Uppers for prompt shipment from Boston were respectively, on March 29, 39⅜ and 38¼ cents; April 5, 41 and 39⅛ cents; April 12, 42⅜ and 41 cents; April 19, 42-9/16 and 42⅞ cents.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. Activity is mostly confined to deliveries against old orders. New business is limited in volume and the market consequently is spotty. Occasional spurts of demand may be expected between now and mid-summer, when new market conditions based on size and value of the new cotton crop will exert their influence. Cotton goods are phenomenally low compared with costs and it is safe to say that goods do not bring within 2 to 5 cents a pound of replacement cost.

Textile inventories in the hands of consuming plants, are probably meager; the bulk of stocks are in the hands of manufacturers. On this account a sharp turn in the market will result from another rush for supplies such as occurred during late summer and autumn of 1923.

RAINCOAT FABRICS. Little or no buying is going on at the present time, and while mills desire business they are unwilling to cut prices any further unless they can secure raw cotton cheaper. Curtailment of mill operations continues and the whole trade seems to be marking time.

SHEETINGS. The market is not active on sheetings although the prices quoted are based on cotton considerably less than current market prices. There is a drastic curtailment of production not only by New England mills, but also on the part of mills in the South and consequent desire for orders. Some mills have stocks of goods, but, generally speaking, the buyers are short of supplies.

TIRE FABRICS. The market on tire fabrics is quiet and considered fairly well established. New business is sought on the basis of 25 cents for raw cotton or even less. Tire makers have passed their peak requirements and there is a tendency to reduce the number of plies in high pressure tires. Business in hand assures operation of fabric mills for about two months.

Experiments in balloon tires favor the use of long staple Egyptian cotton grades. The development of these tires is resulting in much temporary confusion of the tire manufacturing situation because of the serious problems involved and the unpreparedness of tire companies to cope with the general demand.

New York Quotations

April 25, 1924

Drills

38-inch 2.00-yard	yard	$0.23½ @
40-inch 3.47-yard		.13⅝ @
52-inch 1.90-yard		.24¾ @
60-inch 1.52-yard		.31⅝ @

Duck

CARRIAGE CLOTH

38-inch 2.00-yard	yard	.24¼ @
40-inch 1.47-yard		.33 @
72-inch 16.66-ounce		.54¼ @
72-inch 17.21-ounce		.56 @

MECHANICAL

Hose	pound	.46 @
Belting		.46 @

TENNIS

52-inch 1.35 yard	yard	.36½ @

Osnaburgs

40-inch 2.35-yard	yard	.20½ @
40-inch 2.48-yard		.19¾ @
40-inch 3.00-yard		.16 @
37½-inch 2.42-yard		.19⅞ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	yard	$0.13 @
Bombazine 60 x 48		.12¼ @
Plaids 60 x 48		.13 @
Plaids 48 x 48		.12 @
Surface prints 60 x 48		.13 @
Surface prints 64 x 60		.14 @

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.16¾ @ .17
48 x 48, 2.85-yard		.14½ @ .14¾
64 x 68, 3.15-yard		.14 @
56 x 60, 3.60-yard		.12½ @ .12¾
48 x 44, 3.75-yard		.11¼ @ .11½

Sheetings, 36-inch

48 x 48, 5.00-yard	yard	.09 @ .09¼
40 x 40, 6.15-yard		.07¼ @

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Egyptian, karded	pound	$0.62 @ .65
Peeler, karded		.56 @ .58

CORD 23/5/3

Egyptian, combed	pound	.76 @ .78
Egyptian, karded		.64 @ .67
Peeler, combed		@
Peeler, karded		.58 @ .60

CORD 13/3/3

Peeler, karded	pound	.56 @ .58

LENO BREAKER

8-oz. Peeler, karded	pound	.56 @ .58
10-oz. Peeler, karded		.56 @ .58

CHAFER

8.25-oz. Peeler, karded	pound	.56 @ .58
9.5-oz. Peeler, karded		.56 @ .58
12-oz. Peeler, karded		.56 @ .58
14-oz. Peeler, karded		.56 @ .58

The Cotton Outlook

CONSERVATISM continues to characterize the trend of the cotton and textile market, and numerous potent influences are causing much confusion in the trade.

The apathy of the goods market for the past several months has caused an abnormal situation, with the result that caution is being exercised on all sides and speculative activity has been materially hampered. The present political outlook is also a potent influence, while the uncertainty surrounding the new crop is serving to complicate matters still further.

The half-year figures of the International Federation of Master Cotton Spinners and Manufacturers Associations covering the period ended January 31, 1924, showing that the world consumption of American cotton, exclusive of linters, fell off 930,000 bales from the consumption during the same period of the preceding year, indicates that the supply situation is not so stringent as had generally been believed.

The new crop will from now on be a major market factor, and the trade is beginning to swing its attention to the situation in the growing area.

A slow improvement is being noted in the cotton fabric markets, though only small lot, hand-to-mouth buying seems likely. Many manufacturers find it impossible to dispose at profitable prices of goods made from cotton bought at a basis much below the present market and hence see no justification for financing and storing production in anticipation of sales. Some mills have been shut down and others operating on curtailed schedules for some time, and while some are resuming or increasing activities a little, others are curtailing still farther. While the outlook is perhaps slightly improved just at present, the immediate prospects are not over bright.

The effects of overproduction in the cotton spinning industry are now being felt throughout the entire trade. The stocks of goods that have accumulated in the cotton mills are greatly disproportionate to any demand that is likely to develop therefor within the next several weeks. The inability of the mills to dispose of these stocks has resulted in the general curtailment that now is in effect, and has given rise to a well-founded pessimism in the spinning trade.

Our World Trade in Cotton and Cotton Goods

Exports

Cotton and textile exports generally were higher in value and lower in volume in 1923 than in 1922.

Statistics of exports and imports for the year 1923, compiled by the foreign commerce department of the Chamber of Commerce of the United States, indicate that manufactured cotton was the chief export of the United States according to value, the amount being $807,103,000, or 19.7 per cent of the value of total exports of all commodities for the year. This total value represents a rise of 20 per cent above the 1922 figure, due entirely to the sharp rise in prices, there being a decided loss in the quantity shipped abroad.

Exports of manufactured cotton in thousands of pounds totaled 2,742,968 in 1923, against 3,153,327 in 1922 and a prewar average of 4,411,354. This means a decrease of 13 per cent from the preceding year and of 37.8 per cent from the prewar average.

Exports of cotton cloth during 1923 were valued at $79,313,000, or 1.9 per cent of total exports. A total of 464,294,000 square yards was exported, as compared with 587,493,000 square yards in 1922 and a prewar average of 403,778,000 square yards. In quantity, therefore, these exports represented a loss of 20.9 per cent from 1922 but a gain of 14.9 per cent over the prewar average.

United States exports of duck in 1923 aggregated 8,929,817 square yards, according to Commerce Department figures, as against 10,939,685 square yards valued at $4,360,753 in 1922. Canada was the largest purchaser of American duck, having taken 1,476,892 square yards, followed by Cuba with 1,211,837 square yards. Sales of duck to South America totaled 2,486,272 square yards.

Other cotton goods exports for the year were cotton wearing apparel, $25,658,000; cotton mill waste, $7,610,000; cotton yarn, $6,633,000. Although cotton mill waste exports gained 25 per cent in value in 1923 over 1922, it lost 4.4 per cent in quantity from 1922 and 7.2 per cent from the prewar average.

Cotton and Textile Imports

Cotton and textile imports generally were higher in both value and volume in 1923 than in 1922.

Imports of unmanufactured cotton valued at $49,443,000 stood seventeenth in the list of all commodity imports for 1923 and represented 1.3 per cent of all imports. In thousands of pounds imports of unmanufactured cotton were 187,365 in 1923, as compared with 186,181 in 1922 and a prewar average of 104,828. This represented a gain in volume of 0.6 per cent over 1922 and of 78.7 per cent over the prewar average.

Imports of cotton cloth during 1923 were valued at $47,188,000 and represented 1.2 per cent of total imports. There was a gain of 57 per cent in value over 1922. Most textile imports also showed heavy gains in volume.

Imports of cotton laces and embroideries were valued at $17,014,000; cotton wearing apparel, $12,894,000; cotton waste, $6,728,000; cotton yarn and warps, $5,667,000. Cotton waste imports increased 152 per cent in value and 171.2 per cent in quantity over 1922, and 88.8 per cent over the prewar average. In thousands of pounds cotton waste imports were 77,022 in 1923, as compared with 28,399 in 1922 and a prewar average of 40,779. Cotton yarn and warps, with imports of 5,269,000 pounds, were 2.8 per cent below the 1922 imports.

United States Cotton Statistics

Census Bureau statistics show that cotton consumed during March amounted to 483,928 bales of lint and 41,030 of linters, compared with 507,876 of lint and 41,698 of linters in February this year, and 624,264 of lint and 54,509 of linters in March last year.

Cotton on hand March 31 was held as follows:

In consuming establishments, 1,498,266 bales of lint and 126,149 of linters, compared with 1,578,272 of lint and 123,099 of linters on February 29 this year, and 2,033,837 of lint and 172,600 of linters on March 31 last year.

In public storage and at compresses 1,983,544 bales of lint and 89,032 of linters, compared with 2,485,009 of lint and 87,087 of linters on February 29 this year and 2,379,697 of lint and 49,258 of linters on March 31 this year.

In other words, the end of the first quarter of the year finds stocks of cotton in mills and warehouses of the United States 931,724 bales less than a year ago.

Imports during March totaled 49,832 bales, compared with 48,601 in February this year and 53,219 in March last year.

Exports during March totaled 332,168 bales, including 17,091 bales of linters, compared with 482,146 including 12,275 of linters during February this year and 318,210 including 8,347 of linters in March last year.

Cotton spindles active during March totaled 32,392,171, compared with 32,683,786 in February this year and 35,498,234 in March last year.

The Market for Chemicals and Compounding Ingredients

New York

COMPOUNDING ingredients generally have been moving in routine volume. Prices have not advanced and rubber manufacturers have in some instances asked for delayed delivery due to caution in advancing manufacturing schedules.

ACCELERATORS. The popular accelerators are in good demand. They are well established as vital in current rubber practice. Every factory employs one or two accelerators for standard goods, generally of the milder type such as aniline and thiocarbanilide. Business in ultra-accelerators is increasing because they confer the advantage of short cures at low temperatures. All of the ultra-accelerator list shares in this development in curing practice, the basic feature of which is increased economy in the production of rubber goods.

CARBON BLACK. Prices are unchanged. Trade was reported brisk a month ago. Stocks have been reduced and shipments are being made from current production. There is, however, no appreciable shortage of stocks.

Restriction of the supply of gas to carbon black plants in Louisiana will serve to correct the condition of over-production under which the market has labored for the past two years caused by over-expansion of producing capacity.

One effect of this policy has been to reduce stocks and raise prices correspondingly. Current deliveries of black on contract continue to be taken by tire companies and the mechanical goods manufacturers.

FILLERS. Trade in rubber fillers bulks large even under routine conditions. Their movement, considered as an index of rubber manufacturing activity, shows that the rubber industry is fairly well engaged but cautious as to overstocking even on standard supplies. Whiting grades are still competitive as last month. Careful compounders will discriminate in their use, as every grade of whiting has its special compounding merit, which it is well to observe. Clays are moving freely although under less insistent demand than a month ago. Asbestine is in routine demand at steady prices.

LEAD PIGMENTS. Litharge and sublimed lead are unchanged in price and in moderate demand by the footwear and mechanical goods trade.

OXIDE OF IRON is moving in fair volume and the same holds true for other rubber colors.

ZINC OXIDE. Production of zinc oxide is in good volume. Stocks are maintained at moderate volume. The fact that pressure for current delivery of tires is not as insistent as expected during the first two months of the year has occasioned requests for delay of contract deliveries of zinc oxide as well as other compounding ingredients that run into large tonnage.

New York Quotations

April 25, 1924

Accelerators, Inorganic			
Lead, carbonate	*lb.*	$0.10¼	@
Lead, red	*lb.*	.12	@
sublimed blue	*lb.*	.09¾	@
sublimed white	*lb.*	.09¾	@
Lime, flour	*lb.*	.02½	@
R. M.	*lb.*	.01¼	@ .01½
R. M. hydrated	*ton*	25.00	@
superfine	*ton*	30.00	@
Litharge, domestic	*lb.*	*.10½	@ .12½
imported	*lb.*	*.17	@
Magnesia, carbonate, light	*lb.*	.07½	@ .09
calcined, light (bbls.)	*lb.*	.24	@
calcined, ex. light (bbls.)	*lb.*	.40	@
calcined, md. light (bbls.)	*lb.*	.15	@
calcined, heavy (bbls.)	*lb.*	.04½	@ .06½
Orange mineral A.A.A.	*lb.*	.15	@
Rubber lead	*lb.*	.10	@
Accelerators, Organic			
A-7	*lb.*	.75	@ .85
A-19	*lb.*	.85	@ .95
Accelemal	*lb.*	.30	@
Accelerene (f. o. b. English port)	*lb.*	13*d.*	@
Aldehyde ammonia powder	*lb.*	.95	@
Aniline (f. o. b. factory)	*lb.*	.16½	@ .18
sulphate	*lb.*	.33	@ .35
Cryline	*lb.*	.60	@
Diphenylguanidine	*lb.*	1.15	@
Ethylidene aniline	*lb.*	.70	@ .75
Excellerex	*lb.*	.40	@ .45
Formaldehyde aniline	*lb.*	.42½	@
H. R.	*lb.*	1.40	@ 1.50
Hexamethylene tetramine	*lb.*	.85	@
Lead oleate (bbls.)	*lb.*	.15	@
Methylene aniline	*lb.*	.37	@ .45
No. 999	*lb.*	.16	@
Paraldehyde	*lb.*	.17	@ .19
Para-nitros-dimethyl aniline	*lb.*	.35	@
Paraphenylene diamine	*lb.*	1.40	@ 1.50
Quinodine	*lb.*	$0.55	@
Super-sulphur, No. 1	*lb.*	.50	@ .60
No. 2	*lb.*	.25	@ .35
Super-X	*lb.*	.30	@
Tuads (Tetramethyl thiuram-disulphide)	*lb.*	6.00	@
Thiocarbanilide	*lb.*	.27	@ .32
Triphenylguanidine	*lb.*	.70	@ .75
Acids			
Acetic 28% (bbls.)	*cwt.*	3.38	@
glacial (carboys)	*lb.*	.16	@
Cresylic (95% straw color)	*gal.*	.73	@ .78
(95 dark)	*gal.*	.65	@ .70
Sulphuric, 66 degrees	*lb.*	.02	@
Alkalies			
Caustic soda	*cwt.*	3.10	@ 4.50
flake, 76% (factory)	*cwt.*	3.60	@ 3.85
solid, 76% (factory)	*cwt.*	3.10	@
Colors			
BLACK			
Bone	*cwt.*	7.80	@ 8.25
Carbon black	*lb.*	.09	@ .14
compressed	*lb.*	.09½	@ .14
Drop	*cwt.*	7.80	@ 8.25
Gritless black	*lb.*	.40	@
Ivory black	*lb.*	.15	@ .45
Lampblack	*lb.*	.11	@ .14
Micronex	*lb.*	.09½	@ .15
Shawinigan	*lb.*	.17	@ .18
BLUE			
Cobalt	*lb.*	.21	@ .26
Gritless blue	*lb.*	2.00	@ 4.00
Prussian	*lb.*	.40	@ .43
Ultramarine	*lb.*	.15	@ .35
T. K.	*lb.*	.25	@ .30
BROWN			
Iron oxide	*lb.*	.04½	@ .05½
Sienna, Italian	*lb.*	.05½	@ .06
Umber, Turkey	*lb.*	.04½	@ .05½
GREEN			
Chrome, light	*lb.*	$0.30	@ $0.31
medium	*lb.*	.32	@ .35
dark	*lb.*	.35	@ .38
commercial	*lb.*	.11½	@ .12
tile	*lb.*	.13	@ .15
Gritless green	*lb.*	2.00	@ 3.00
Oxide of chromium	*lb.*	.36	@
T. K.	*lb.*	.42	@
RED			
Antimony, golden	*lb.*	.20	@ .22
golden T. K.	*lb.*	.20	@
golden R.M.P. No. 7	*lb.*	.20	@
golden, 15/17% G. E.	*lb.*	.20	@ .22
golden, 15/17% F. S.	*lb.*	.18	@
golden, No. 1	*lb.*	.30	@
golden, No. 2	*lb.*	.20	@
Tideco	*lb.*	.22	@ .52
Antimony, crimson	*lb.*	.40	@ .42
crimson T. K.	*lb.*	.48	@
crimson, 15/17% G. E.	*lb.*	.40	@ .45
crimson, 15/17% F. S.	*lb.*	.40	@
crimson, R.M.P. No. 3	*lb.*	.50	@
crimson F.	*lb.*	.45	@
7-A	*lb.*	.35	@
Golden pentasulphide T. K.	*lb.*	.38	@
Vermilion, 5% F. S.	*lb.*	.65	@
Vermilion 15/17% F.S.	*lb.*	.50	@
T. K.	*lb.*	1.25	@
Arsenic-sulphide, red	*lb.*	.14¼	@
Gritless red (four shades)	*lb.*	1.50	@ 3.00
purple	*lb.*	2.00	@ 3.00
Indian maroon, English	*lb.*	.12	@
Iron oxide, domestic	*lb.*	.09	@ .12
English	*lb.*	.12	@ .14
Indian	*lb.*	.11	@ .12
pure bright	*lb.*	.12	@ .14
reduced	*lb.*	.10	@
Spanish	*lb.*	.03	@ .04
Venetian	*lb.*	.03	@ .06
Oximony	*lb.*	.16	@
Pará toner	*lb.*	1.00	@ 1.10
Toluidine toner	*lb.*	2.00	@ 2.10
Vermilion, English	*lb.*	1.30	@ 1.50

*Nominal.

Colors—*Continued*

WHITE

Albalith	lb.	$0.06⅞	@$0.07⅛
Aluminum bronze	lb.	.55	@ 1.25
Lithopone	lb.	.06½	@ .07⅛
Lithopone, Sterling	lb.	.06¾	@ .07
Azo	lb.	.06¾	@ .06¾
R. S. L.	lb.	.07	@
Red Seal, imported	lb.	.06¾	@ .07¼
T. O. Pigment L. H. B.	lb.	.15½	@ .16¼
Zinc oxide:			
AAA, lead free	lb.	.08	@ .08¼
Azo (factory):			
ZZZ (lead free)	lb.	.08	@ .08¼
ZZ (—5% leaded)	lb.	.07⅛	@ .07¾
Z (8.10% leaded)	lb.	.07⅛	@ .07¾
French process, Florence brand			
Green seal	lb.	.11	@ .11¼
Red seal	lb.	.10	@ .10¼
U. S. P.	lb.	.16	@ .18
White seal	lb.	.12	@ .12¼
Horse Head brands			
Selected	lb.	.08¼	@ .08⅞
Special	lb.	.08¼	@ .08⅞
XX red	lb.	.08¼	@ .08¾
Leaded brands			
Lehigh	lb.	.07¼	@ .07½
Standard	lb.	.07¼	@ .07½
Sterling	lb	.07¼	@ .07½
Superior	lb.	.07¼	@ .07½
Palmerton process			
Kadox, black	lb.	.12	@ .12¼
blue	lb.	.11	@ .11¼
red	lb.	.10	@ .10¼
Snow white	lb.	.11¾	@

YELLOW

Arsenic	lb.	.75	@
Chrome	lb	.18	@ .18½
Gritless yellow	lb.	2.50	@ 4.00
India rubber	lb.	.75	@
Ochre, domestic	lb.	.01½	@ .02½
imported	lb.	.03¼	@ .04¼

Compounding Ingredients

Aluminum flake (carloads)	ton	29.00	@
filler	ton	23.00	@
hydrate, light	lb.	.17	@ .18
Ammonia carbonate	lb.	.13	@ .14½
Asbestine	ton	20.00	@25.00
Aluminum silicate	ton	22.00	@25.00
Barium, carbonate, precip.	ton	85.00	@90.00
dust	lb.	.05	@ .06
Barytes, imported	ton	28.00	@33.00
pure white C. L.	ton	23.90	@
off color	ton	20.00	@
uniform floated	ton	23.90	@
water ground and floated	ton	23.00	@26.00
Basofor	lb.	.04¼	@
Blanc fixe	lb.	.04	@ .04¼
Carrara filler (factory)	lb.	.01¾	@
Chalk, precip. extra light	lb.	.04¼	@ .05
heavy (f.o.b. factory)	lb.	.03¼	@ .04
Clay, Dixie	ton	22.00	@35.00
Blue ribbon (carloads)	ton	14.00	@
Blue Ridge	ton	12.00	@26.00
China	lb.	.01½	@
L. H. B. (factory)	ton	22.50	@
Tideco (factory)	ton	10.00	@
Cotton flock, black	lb.	.12	@
light-colored	lb.	.12	@ .13½
white	lb.	.14½	@ .23
Cotton linters clean mill-run	lb.	.06	@
Fossil flour (powdered)	ton	60.00	@
(bolted)	ton	60.00	@

* Nominal.

Chemical Market—*Continued*

New York Quotations

April 25, 1924

Glue, high grade	lb.	$0.22	@$0.30
medium	lb.	.20	@ .26
low grade	lb.	.15	@ .18
Graphite, flake	lb.	.06½	@ .12
Infusorial earth (powd.)	ton	60.00	@
(bolted)	ton	65.00	@
Lime (bolted)	lb.	.02	@
Mica, amber	lb.	.05	@
powdered	lb.	*.15	@
white	lb.	.06	@
Pumice stone, powdered	lb.	.03	@ .05
Rotten st., powd. (bbls.)	lb.	.02½	@ .04½
Slate flour (factory)	ton	15.00	@
Soap bark, cut	lb.	.09½	@ .09¾
Soapstone, powdered, gray	ton	12.00	@22.00
Sodium bicarbonate (bbls.)	lb.	.02	@
Starch, powd. corn (bags)	cwt.	3.27	@ 3.37
(bbls.)	cwt.	3.54	@ 3.64
Talc, soapstone	ton	25.00	@
Terra blanche	ton	23.00	@27.00
Whiting, Alba	cwt.		@
chalk, L. H. B.	ton	16.50	@25.00
commercial	cwt.	.90	@ 1.00
English, cliffstone	cwt.	1.50	@ 1.75
gildera (bolted)	cwt.	1.10	@ 1.20
K. T.	ton		@
Perfection	ton	12.50	@23.00
Quaker	ton	13.00	@22.00
Superfine, L. H. B.	ton	12.50	@22.50
Sussex	ton	8.00	@16.00
Witco	ton	20.00	@
York	ton	12.00	@
Wood pulp, XXX	ton	35.00	@
X (f. o. b. factory)	ton	25.00	@

Mineral Rubber

Genasco (factory)	ton	50.00	@52.00
Gilsonite	ton	65.00	@
Granulated M. R.	ton	40.00	@60.00
Hard hydrocarbon	ton	31.00	@50.00
Liquid rubber	lb.	.10	@
Ohmlac Kapak, K-R	ton	50.00	@60.00
K-4	ton	175.00	@
Soft hydrocarbon	ton	30.00	@50.00
320/340 M. P. hydrocarbon	ton	45.00	@50.00
300/310 M. P. hydrocarbon	ton	40.00	@45.00
Pioneer, M. R., solid (fac.)	ton	42.00	@44.00
M. R. granular	ton	52.00	@54.00
Robertson, M. R., solid	ton	35.00	@75.00
M. R. granular (factory)	ton	42.00	@80.00
Rubrax (factory)	ton	60.00	@
Synpro, gran. M. R. (fac.)	ton	55.00	@

Resins and Pitches

Tar, pine, retort	bbl.	11.00	@12.00
kiln	bbl.	11.00	@12.00
Pitch, Burgundy	lb.	.05½	@
coal tar	bbl.	8.00	@
Fluxol hardwood	lb.	.02	@ .04
pine tar	bbl.	6.00	@
ponto	lb.	.05½	@
Rosin, K (bbl.)	280 lbs.	6.15	@
strained (bbl.)	280 lbs.	6.15	@
Shellac, fine orange	lb.	.75	@ *.90
substitute	gal.	2.00	@

Softeners

Avoilas compound	lb.	.14	@
Castor, No. 1, U. S. P.	lb.	.17½	@
No. 3, U. S. P.	lb.	.17	@
Corn, crude (bbls.)	lb.	.12½	@
Cotton, Summer yellow	lb.	.11½	@
Cycline	gal.	.35	@ .38
Glycerine	lb.	$0.17	@$0.17½
Linseed, raw	gal.	.96	@
Palm lagos	lb.	.10	@
oil clarified L. H. B.	lb.	.10	@
Palm, niger	lb.	.09	@
Parra M. R. flux	lb.	.06	@ .07
Peanut, crude	lb.	.13	@
refined	lb.	.15	@
Petrolatum, standard	lb.	.06	@ .08
Petrolatum, sticky	lb.	.08	@ .10
Pine, steam distilled	gal.	.60	@ .65
Rapeseed, refined	gal.	.92	@
blown	gal.	1.08	@
Rosin	gal.	.45	@ .50
Synpro	gal.		@
Soya bean	lb.	.11¾	@
Tar	gal.	.26	@
Woburn	lb.	.05	@
Woolgrease (Lanolin)	lb.	.10	@ .10½

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	lb.	.25	@ .25½
Benzol (90% drums [7.21 lbs. per gal.])	gal.	.26	@ .31
pure (drums)	gal.	.42	@
Carbon bisulphide (drms. [10.81 lbs. per gal.])	lb.	.07	@ .08
tetrachloride (drums. [13.28 lbs. per gal.])	lb.	.08	@ .09
Hartol No. 303			
Tankcars	gal.	.21	@
Drums, carlots	gal.	.24	@
Drums, less carlots	gal.	.27	@
Motor gasoline (steel bbls.)	gal.	.20	@
Naphtha, V. M. & P.	gal.	.19	@
solvent (drums extra)	gal.	.27	@
68° Bé., 122°, 324°	gal.	.18	@
70° Bé., 114°, 314°	gal.	.19	@
71° Bé., 112°, 304°	gal.	.20	@
Cymene (factory)	gal.	2.00	@ 2.50
Toluol, pure (7.21 lbs. per gal.)	gal.		@
Turpentine, spirits	gal.	.92	@
wood, steam distilled	gal.	.82	@

Substitutes

Black	lb.	.08	@ .14
Brown	lb.	.10	@ .15
White	lb.	.09	@ .16
Brown factice	lb.	.09	@ .15
White factice	lb.	.09	@ .15
T. K., various	lb.	.12	@ .15

Vulcanizing Ingredients

Black hypo, T. K., S. F.	lb.	.18	@
13% F. S., L. H. B.	lb.	.20	@
Sulphur chloride	lb.	.08	@ .13½
Sulphur, Bergenport brand, 100% pure (bbls.)	cwt.	2.60	@ 3.15
(bags)	cwt.	2.35	@ 2.90
Sulphur, Bklyn bd. (bbls.)	cwt.	2.75	@ 3.30
superfine com. (bgs.)	cwt.	2.00	@ 2.50
(bbls.)	cwt.	2.40	@ 2.90
Rubber makers	lb.	.03¼	@ .03½

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	lb.	.40	@ .45
ceresine, white	lb.	.10	@ .12
carnauba	lb.	.19	@
montan	lb.	.05½	@ .06
ozokerite, black	lb.	.18	@ .24
green	lb.	.27	@ .28
sweet wax	lb.	.12	@

Paraffin

122/124 white crude scale	lb.	.06	@
124/126 white crude scale	lb.	.06¼	@ .06½
120/122 fully refined	lb.	.05½	@ .05¾
125/127 fully refined	lb.	.06	@ .06¼

WORLD'S EXPORTS OF RUBBER FOOTWEAR

The accompanying tabulation, prepared by the Rubber Division, Department of Commerce, is of interest as showing the increasing trade in rubber footwear, and the part played in this trade by leading nations.

EXPORT TRADE IN RUBBER FOOTWEAR, 1922 AND 1923:

Countries of origin	1922 Pairs	1922 Value	1923 Pairs	1923 Value
Total	16,500,000	$11,000,000	18,200,000	$12,500,000
	Per cent	Per cent	Per cent	Per cent
United States	24.8	34.2	29.0	38.0
France	25.5	19.3	15.0	11.0
Austria	19.5	14.6	16.4	11.8
United Kingdom	10.9	11.0	14.7	13.2
Canada	8.6	11.1	11.7	14.0
Germany	7.6	5.7	8.8	6.4
Sweden	3.1	4.1	4.4	5.6

DETROIT TO HOLD AUTOMOTIVE MAINTENANCE EQUIPMENT SHOW

In conjunction with the National Automotive Service Convention and World Motor Transport Congress, there will be held in Detroit, Michigan, from May 19 to 23 an Automotive Maintenance Equipment Show, which promises to meet with success. One of the members of the show committee is M. L. Heminway, general manager of the Motor and Accessory Manufacturers' Association.

AMERICAN TRADE IN RUBBER BOOTS INCREASED ABOUT 63.3 PER cent during 1923 as compared with 1922, while trade in rubbers, overshoes, and arctics (included under rubber shoes) increased about 25.5 per cent.

Metal Market Review

New York

In general the markets during April remained quiet, and most of them were decidedly easier. Demand for all the metals, and zinc in particular, continued light. During the early part of the month there was an evident falling off in new orders for steel, this tendency appearing in March, following an output somewhat similar to that of war times. The decrease in automobile production is in part responsible for this lessened demand for steel.

ALUMINUM. Although there is a lull in the automotive industry, prices for aluminum are being maintained on the basis heretofore prevailing. With the possibility of lessened automotive consumption there may be an increase in the number of resale offerings.

ANTIMONY. With offerings from China more liberal, the antimony market is decidedly easier. Wholesale lots are quoted down to 10.25 cents, New York, duty paid, for early delivery.

COPPER. Shipments for the first quarter of the year totaled 720,000,000 pounds, the highest record so far made. Of the March shipments 160,000,000 pounds were domestic, which compares with the previous high point reached in March, 1923, of 149,000,000 pounds. The general undertone of the copper market appears to be better, and authorities are prophesying a rise in price within the next few weeks.

LEAD. Although producers have been making concessions for future shipments, consumers have not appeared interested, and the market has remained dull. Prices have, however, been somewhat affected by the market in London, and there is also some increase in production.

NICKEL. Shot and ingot nickel are quoted unchanged at 29 to 32 cents a pound, with electrolytic nickel held at 30 to 32 cents by the leading producers. In the outside market both shot and ingot nickel are quoted at 28 to 32 cents a pound.

STEEL. March is said to have represented a new high record in steel production, passing the previous record made in April, 1923, by a trifle over 1 per cent. According to reports by the American Iron and Steel Institute, production of steel ingots in March was 4,145,829 gross tons, while the rate of production for that month was 15 per cent above the 1923 output, which in turn was 35 per cent over the four-year average. With the tapering off of orders in April, however, lower prices began to be quoted for some steel products, while buying during the middle of April was well below production, and was probably lighter than in any preceding week since December last.

TIN. Straits tin shipments during the first half of April were only half those of the corresponding period of March, totaling only 2,060 tons, as compared with 4,135 tons in March. During the early part of April the market showed great irregularity, prices in less than a month going down 20 per cent. Consumers, feeling that a decline in price was due, bought only what they needed for prompt use.

ZINC. For the first time since last September a decrease was reported in this country's zinc surplus. According to statistics prepared by the American Zinc Institute, stocks decreased in March 5,118 tons, and in February 3,505 tons. Production during March was 47,775 tons, contrasted with 43,933 tons in February, and 49,709 tons in January. Notwithstanding the favorable statistics for March, prices declined $4 a ton during the second week of April, being now the lowest of the year.

Basic Metals

APRIL 24, 1924

Aluminum, virgin, 98@99 per cent	28.00	@29.00
Antimony, pound	9.75	@10.00
Copper—Lake, spot, pound	.13¾@	.13¾
Electrolytic, spot	.13½@	.13⅝
Casting refinery	.13¼@	
Lead, spot, New York, pound	7.87½@	8.25
Lead, spot, East St. Louis	7.62½@	7.75
Nickel, ingot, pound	.29 @	.32
Tin, spot	.49 @	
Zinc, spot, New York	6.45 @	
Zinc, spot, East St. Louis	6.10@	6.15

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSE	Cents per pound	
Bright basic	4.50	@ 4.75
Annealed soft	4.50	@ 4.75
Galvanized annealed	5.15	@ 5.40
Coppered basic	5.15	@ 5.40
Tinned soft Bessemer	6.15	@ 6.40

*Regular extras for lighter gage.

Copper Wire

		F. O. B. Factory	
Bare copper wire	lb.	*.16	@ —
No. 6 B. & S. gage	lb.	*.16	@ —
No. 8 B. & S. gage	lb.	*.16	@ —
No. 14 B. & S. gage	lb.	.17	@ —

*Base price.

TEXTILE CALENDAR

The American Cotton Manufacturers' Association will hold its annual convention May 27-28, at the Hotel Traymore, Atlantic City, New Jersey.

The spring meeting of the Southern Textile Association will be held June 13-14, at Blowing Rock, North Carolina.

The annual meeting of the Cotton Manufacturers' Association of North Carolina, and joint meeting with the Cotton Manufacturers' Association of South Carolina, will be held June 27-28 at Blowing Rock, North Carolina.

The Southern Textile Exposition will be held October 20-25 at Textile Hall, Greenville, South Carolina.

Plantation Rubber Exports from Dutch East Indies

Java and Madura

	Year		January	
	1922 Kilos	1923 Kilos	1923 Kilos	1924 Kilos
To—				
Netherlands	3,164,000	2,880,000	224,000	227,000
England	4,947,000	5,734,000	505,000	711,000
Germany	1,233,000	329,000	26,000	42,000
France	227,000	442,000	99,000	9,000
Belgium	11,000	17,000	.....	.....
Italy	191,000	288,000	14,000	21,000
Canada	.....	54,000	.....	.....
United States	19,254,000	22,028,000	1,176,000	1,873,000
Singapore	2,408,000	1,537,000	127,000	276,000
Japan	131,000	601,000	.....	137,000
Australia	93,000	185,000	.....	22,000
Other countries	.....	.....	9,000	.....
Total	31,659,000	34,095,000	2,180,000	3,318,000
Ports of Origin:				
Tandjong Priok	13,890,000	14,374,000	1,081,000	1,133,000
Cheribon	57,000	70,000	.....	.....
Samarang	886,000	2,339,000	90,000	172,000
Soerabaya	14,772,000	12,792,000	776,000	1,510,000
Pasoeroean	160,000	1,204,000	72,000	103,000
Probolinggo	630,000	762,000	.....	.....
Panaroekan	83,000	1,192,000	.....	.....
Banjoewangi	524,000	809,000	.....	.....
Tjilatjap	658,000	547,000	26,000	187,000

Belawan-Deli

	Year		January	
	1922 Kilos	1923 Kilos	1923 Kilos	1924 Kilos
To—				
Netherlands	1,495,000	1,828,000	1,080,000	170,000
England	2,096,000	4,214,000	1,044,000	298,000
Germany	533,000	200,000	499,000	.....
France	248,000	417,000	498,000	.....
Belgium	37,000	204,000	.....	5,000
Denmark	.....	.....	305,000	.....
Italy	52,000	335,000	.....	20,000
Austria	.....	25,000	.....	.....
United States	22,147,000	27,754,000	.....	2,727,000
Penang	106,000	615,000	.....	106,000
Straits Settlements	.....	152,000	.....	.....
Singapore	3,261,000	2,421,000	24,000	87,000
Japan	10,000	.....	.....	.....
Hongkong	.....	9,000	.....	.....
Australia	503,000	4,000	.....	.....
South America	25,000	.....	.....	.....
Total	30,513,000	38,178,000	3,450,000	3,413,000

Exports of India Rubber Manufactures from the

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Water-proofed Auto Cloth Value	Water-proofed Clothing Value
EUROPE													
Austria	.....	.....	.....	.....	.....	.....	107	$199	828	$784	.....	.....	.....
Azores and Madeira Is.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgium	.....	$78	.....	.....	204	$774	2,703	1,514	.....	.....	.....	$3,297	.....
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Denmark	$314	.....	$156	.....	748	1,922	1,583	815	7,625	6,829	.....	1,320	$111
Finland	1,806	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	4,290	77	453	$8,659	.....	.....	.....	.....	.....	.....	$13	.....	.....
Germany	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	180	.....	.....
Greece	17	1,657	.....	.....	.....	.....	.....	.....	.....	.....	.....	341	.....
Hungary	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland and Faroe Is.	.....	.....	.....	5,349	132	536	60	212	.....	.....	.....	.....	.....
Italy	.....	.....	.....	.....	183	516	.....	.....	48	93	9	.....	.....
Latvia	233	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	.....	1,074	152	.....	.....	.....	72	36	1,272	2,252	481	780	.....
Norway	1,146	283	150	.....	60	116	780	2,030	.....	.....	316	3,172	.....
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal	.....	.....	.....	.....	85	255	.....	.....	.....	.....	509	277	.....
Rumania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia in Europe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	412	.....
Spain	229	88	.....	4,339	.....	.....	.....	.....	.....	.....	2,161	.....	.....
Sweden	3,844	3,191	138	.....	.....	.....	1,061	3,195	.....	.....	.....	.....	114
Switzerland	.....	.....	.....	.....	128	349	1,503	915	652	670	.....	1,089	336
England	10,378	28,858	4,475	64,746	15,013	27,668	7,092	3,002	90,584	66,936	2,545	3,913	2,638
Scotland	1,880	1,397	587	.....	.....	.....	.....	.....	4,196	2,859	.....	142	445
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	100	45	.....	.....	.....
Yugoslavia, Albania, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, EUROPE	$24,157	$36,703	$6,111	$83,093	16,553	$32,136	14,961	$11,918	105,305	$80,468	$6,214	$14,743	$3,644
NORTH AMERICA													
Canada	$9,349	$7,829	$10,809	$4,806	1,522	$4,835	1,261	$663	1,552	$1,339	$478	$25,583	$1,681
British Honduras	25	23	21	.....	.....	.....	.....	.....	10	16	.....	.....	8
Costa Rica	41	344	12	.....	.....	.....	.....	.....	.....	.....	1,020	184	809
Guatemala	.....	190	.....	.....	30	93	.....	.....	654	573	301	198	223
Honduras	343	174	166	.....	.....	.....	.....	.....	736	813	696	95	117
Nicaragua	90	106	79	.....	.....	.....	.....	.....	1,918	1,920	495	.....	.....
Panama	29	1,840	327	.....	120	465	591	745	3,887	3,083	642	.....	300
Salvador	.....	18	.....	.....	.....	.....	.....	.....	636	600	1,774	.....	.....
Mexico	18,674	24,779	6,280	.....	33	132	48	144	11,748	9,448	3,792	1,790	1,877
Miquelon and St. Pierre Is.	.....	.....	.....	.....	468	1,374	.....	.....	.....	.....	.....	.....	.....
Newfoundland and Labrador	316	684	185	.....	5,056	12,047	4,180	2,093	72	56	1,122	23	1,692
Bermuda	.....	17	.....	.....	38	117	76	119	819	641	156	28	92
Barbados	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40	59	.....
Jamaica	95	238	.....	.....	.....	.....	.....	.....	2,476	1,945	75	868	4
Trinidad and Tobago	.....	447	55	.....	.....	.....	.....	.....	.....	.....	.....	175	.....
Other British West Indies	238	.....	.....	.....	.....	.....	48	39	223	185	.....	.....	305
Cuba	3,137	9,778	3,270	45	156	419	743	750	51,192	35,418	9,711	6,445	30,692
Dominican Republic	92	511	741	.....	.....	.....	48	41	564	419	566	.....	315
Dutch West Indies	.....	.....	.....	.....	.....	.....	.....	.....	1,504	981	116	.....	.....
Haiti	235	38	27	.....	.....	.....	36	78	447	391	167	49	44
Virgin Islands of United States	.....	15	.....	.....	.....	.....	.....	.....	406	538	.....	.....	13
TOTALS, NORTH AMERICA	$32,664	$47,031	$22,472	$4,851	7,423	$19,482	7,031	$4,672	78,844	$58,366	$21,151	$35,497	$38,172
SOUTH AMERICA													
Argentina	$2,304	$3,915	$246	.....	912	$2,911	2,129	$1,449	48,510	$43,930	$5,366	$28,124	$823
Bolivia	9,923	655	10	.....	12	44	.....	.....	112	211	.....	.....	.....
Brazil	7,010	676	1,038	$117	.....	.....	2,704	1,686	.....	.....	.....	3,753	.....
Chile	21,048	2,805	1,081	114	.....	.....	6,198	4,737	.....	.....	.....	.....	.....
Colombia	2,270	2,456	536	.....	.....	.....	293	309	6,374	5,146	1,843	162	1,464
Ecuador	177	182	.....	.....	.....	.....	.....	.....	8,524	5,775	584	235	.....
British Guiana	.....	45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dutch Guiana	145	9	.....	.....	.....	.....	.....	.....	96	80	51	.....	.....
French Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paraguay	.....	103	648	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	51	2,365	310	.....	70	436	.....	.....	242	598	236	506	2,101
Uruguay	144	313	514	.....	.....	.....	7,400	5,292	8,858	7,884	2,630	4,126	4,605
Venezuela	1,349	137	699	.....	.....	.....	.....	.....	.....	.....	2,398	.....	81
TOTALS, SOUTH AMERICA	$44,421	$13,661	$5,082	$231	994	$3,391	18,724	$13,473	72,716	$63,624	$13,108	$36,906	$9,074
ASIA													
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	$2,798	$344	$448	.....	70	$178	450	$267	864	$888	.....	$519	.....
Ceylon	.....	.....	.....	.....	.....	.....	350	277	240	168	.....	.....	.....
Straits Settlements	.....	265	111	.....	.....	.....	.....	.....	994	844	.....	.....	.....
China	161	1,123	145	.....	.....	.....	48	42	6,488	6,786	$721	10,611	.....
Chosen	.....	42	42	.....	.....	.....	120	87	.....	.....	.....	.....	.....
Java and Madura	2,620	685	1,485	.....	.....	.....	.....	.....	951	1,566	.....	2,212	.....
Other Dutch East Indies	.....	418	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Far Eastern Republic	.....	.....	160	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hejaz, Arabia, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hongkong	.....	.....	1,018	.....	130	319	456	414	4,816	4,278	.....	318	$170
Japan	2,554	4,902	2,810	11,246	21,649	32,650	33,596	32,100	324	367	.....	1,285	190
Kwangtung leased territory	.....	.....	.....	.....	.....	.....	.....	.....	96	66	.....	295	.....
Palestine and Syria	.....	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	332	.....
Philippine Islands	6,440	2,614	1,111	.....	.....	.....	5,280	3,608	43,914	37,002	4,344	6,924	5,934
Siam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Turkey in Asia	.....	1,778	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, ASIA	$14,573	$12,182	$7,330	$11,246	21,849	$33,147	40,300	$36,795	58,687	$51,965	$5,065	$22,496	$6,294

United States by Countries During February, 1924

Pneumatic Casings			Solid Tires		Pneumatic Tubes				Hard Rubber Goods						
Automobile			Automobile and Motor Truck		Automobile										
Number	Value	Others Value	Value	Others Value	Number	Value	Others Value	Tire Repair Materials Value	Battery Jars and Accessories Value	Other Electrical Supplies Value	Others Value	Rubber Water Bottles and Fountain Syringes Value	Other Druggists' Rubber Sundries Value	Bathing Caps Value	Rubber Toys, Balls and Balloons Value
150	$2,469	.....	.....	.....	150	$316	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	104	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
379	6,373	.....	.....	.....	566	1,198	.....	$34	.....	.....	.....	$49	$59	$17	$51
70	1,864	.....	.....	.....	40	99	.....	.....	.....	.....	.....	.....	.....	.....	.....
4,551	43,858	$392	$3,644	.....	4,302	5,818	$94	804	.....	.....	$155	15	471	6,183	38
267	5,065	.....	.....	.....	492	1,014	.....	71	.....	.....	.....	.....	.....	.....	.....
187	4,107	.....	.....	.....	115	346	17	142	$1,906	$65	1,016	.....	3,386	2,491	.....
51	457	.....	.....	.....	25	26	.....	.....	.....	.....	.....	.....	.....	.....	.....
96	2,359	.....	1,604	.....	6	12	.....	121	.....	.....	.....	80	.....	.....	.....
54	594	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
754	9,414	.....	.....	.....	122	183	.....	21	.....	.....	.....	.....	.....	.....	.....
34	619	.....	.....	.....	1,049	1,826	.....	.....	.....	.....	.....	.....	.....	2,312	.....
.....	.....	.....	.....	.....	23	53	.....	.....	.....	.....	.....	.....	.....	.....	.....
224	2,251	.....	1,379	.....	884	4,627	.....	136	.....	.....	113	.....	1,061	2,023	689
1,597	23,333	1,742	2,973	.....	2,334	3,433	726	1,481	.....	.....	100	.....	81	558	32
68	844	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
130	1,956	.....	.....	.....	1,133	2,624	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	163	.....	.....	.....	.....	.....	.....
500	4,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
690	16,616	18	20,269	.....	1,460	4,620	.....	2,028	.....	.....	.....	.....	.....	1,737	133
1,728	24,179	3,458	3,633	.....	1,110	2,649	435	220	124	.....	521	38	1,085	3,151	412
33	1,550	.....	217	.....	8	67	.....	432	.....	.....	.....	53	178	3,501	.....
8,962	93,723	.....	61,685	$19	6,500	10,325	4	1,631	1,164	.....	7,643	3,525	24,276	26,507	37,176
45	327	.....	8,498	.....	.....	.....	.....	.....	.....	.....	465	.....	712	2,425	5,692
558	4,248	.....	.....	.....	438	510	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	135	.....	.....	.....	.....	.....	.....	.....
21,138	$250,810	$5,610	$103,902	$19	20,757	$39,746	$1,276	$7,256	$3,357	$65	$10,013	$3,760	$31,309	$50,905	$44,223
4,696	$48,280	$64	$13,051	$794	1,486	$5,951	$76	$6,226	$10,480	$4,513	$7,592	$738	$10,739	$658	$13,153
18	120	.....	.....	.....	18	60	.....	28	.....	1	77	.....	28	.....	.....
67	1,665	.....	118	.....	59	154	.....	.....	.....	.....	.....	.....	170	.....	.....
43	581	71	.....	.....	82	167	.....	90	.....	.....	.....	.....	.....	14	64
100	2,635	.....	1,902	.....	102	293	.....	22	.....	.....	.....	20	15	19	.....
49	718	.....	.....	.....	103	165	.....	.....	.....	.....	.....	.....	74	.....	45
1,477	17,532	88	1,282	334	1,570	3,199	174	123	.....	.....	.....	558	509	.....	53
138	2,537	.....	.....	.....	192	480	.....	49	.....	.....	.....	.....	30	7	323
4,329	57,853	370	20,126	120	10,721	17,398	2	2,085	45	54	640	219	1,969	.....	396
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	44	.....	.....	.....	.....	49	239	.....	.....	.....	27	8	1
.....	.....	.....	.....	177	.....	.....	.....	.....	.....	.....	.....	.....	30	38	.....
98	1,006	.....	.....	.....	56	82	.....	.....	.....	.....	.....	.....	96	16	31
283	3,472	.....	531	.....	412	1,026	.....	.....	.....	.....	.....	.....	4	.....	.....
215	2,886	.....	105	.....	232	414	.....	.....	.....	.....	.....	.....	148	.....	.....
102	1,370	.....	.....	.....	242	339	.....	.....	12	16	.....	.....	11	31	.....
6,527	72,990	177	9,176	31	10,310	17,052	172	1,657	.....	645	259	1,777	4,041	451	1,741
518	5,414	52	.....	.....	244	465	25	128	.....	.....	.....	.....	476	.....	142
80	734	.....	.....	.....	208	302	6	54	.....	.....	.....	.....	12	24	7
97	1,456	28	.....	165	216	357	12	39	.....	.....	71	.....	32	.....	.....
80	615	.....	50	.....	136	196	.....	.....	.....	.....	.....	.....	31	.....	.....
18,917	$221,864	$850	$46,385	$1,621	26,389	$48,100	$467	$10,559	$10,776	$5,229	$8,639	$3,312	$18,442	$1,266	$15,956
12,514	$133,974	$22	$7,564	$2,793	9,462	$16,697	$18	$4,207	.....	.....	$202	$5,946	$7,131	.....	$1,306
2	75	.....	.....	.....	72	166	.....	.....	.....	.....	.....	.....	.....	.....	276
6,359	60,364	95	2,514	.....	16,313	21,857	.....	710	.....	.....	586	350	261	.....	1,442
404	9,052	.....	2,277	.....	788	1,678	182	154	.....	.....	9	1,230	594	$25	174
483	6,571	.....	416	21	519	913	.....	147	.....	.....	.....	.....	1,044	.....	467
156	2,341	.....	274	.....	41	102	.....	.....	.....	.....	.....	.....	.....	.....	.....
21	230	.....	.....	.....	12	18	.....	16	$12	.....	.....	.....	.....	.....	.....
12	119	.....	.....	.....	24	28	.....	14	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	29	.....	.....	.....	.....	.....	.....	.....
80	621	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
1,601	22,718	.....	1,643	.....	1,781	3,656	.....	271	11	$112	.....	250	312	17	324
1,839	18,813	.....	1,152	.....	2,288	3,364	.....	519	.....	.....	.....	229	.....	.....	488
1,162	13,340	100	160	.....	2,304	3,585	70	132	.....	757	.....	75	126	.....	214
24,633	$268,218	$217	$16,000	$2,814	33,604	$52,064	$270	$6,199	$23	$869	$797	$8,080	$9,468	$42	$4,694
35	$359	.....	.....	.....	60	$70	.....	.....	.....	.....	.....	.....	.....	.....	.....
2,116	16,820	$608	$3,481	.....	1,257	1,838	$39	$541	$23	.....	.....	$333	$750	.....	$687
115	1,345	177	376	$6,317	156	230	9	.....	.....	.....	.....	.....	.....	.....	.....
89	1,020	.....	422	.....	32	53	.....	.....	.....	.....	.....	.....	.....	.....	.....
260	2,664	42	112	493	125	560	106	.....	149	.....	90	.....	421	$411	576
170	1,389	.....	100	.....	40	68	.....	.....	.....	.....	.....	.....	.....	.....	.....
307	4,384	.....	3,558	2,014	270	507	.....	290	.....	.....	.....	.....	.....	.....	185
77	1,234	.....	.....	.....	113	240	.....	26	.....	.....	.....	.....	81	.....	61
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
181	1,278	.....	.....	.....	112	139	.....	.....	.....	.....	.....	.....	.....	.....	.....
124	917	.....	.....	.....	15	28	.....	10	.....	.....	.....	.....	7	.....	.....
8,418	117,328	870	29,174	.....	3,556	8,436	119	4,645	.....	.....	113	330	2,322	1,643	10
.....	.....	.....	.....	.....	705	1,072	.....	.....	.....	.....	.....	.....	.....	.....	.....
483	7,164	.....	.....	.....	.....	.....	.....	784	.....	.....	.....	.....	693	45	.....
5,412	56,272	1,085	3,131	6,015	3,268	5,907	788	387	60	.....	.....	183	1,903	15	.....
.....	.....	125	732	.....	.....	.....	.....	.....	.....	.....	.....	.....	58	.....	.....
56	537	.....	.....	156	70	106	.....	26	.....	.....	.....	.....	.....	.....	19
17,843	$212,711	$2,907	$41,086	$14,995	9,779	$19,254	$1,061	$6,709	$232	.....	$203	$846	$6,235	$2,114	$1,538

Exports of India Rubber Manufactures from the

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Waterproofed Auto Cloth Value	Waterproofed Clothing Value
OCEANIA:													
Australia	$9,705	$4,433	$2,044	.....	926	$1,253	3,420	$1,717	516	$804	.....	$17,109	$857
British Oceania	.....	100	.....	.....	.....	.....	475	628	588	630	.....	.....	.....
French Oceania	.....	.....	50	.....	.....	.....	.....	.....	996	990	$87	.....	48
New Zealand	67	845	1,000	.....	4,135	13,250	2,518	1,277	.....	.....	255	944	142
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	252	302	.....	.....	.....
TOTALS, OCEANIA	$9,772	$5,378	$3,094	.....	5,061	$14,503	6,413	$3,622	2,352	$2,726	$342	$18,053	$1,047
AFRICA:													
British West Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British South Africa	$23,692	$23,934	$2,909	$54	228	$1,150	1,557	$967	96	$72	$3,205	$1,038	$1,517
British East Africa	1,741	.....	.....	.....	.....	.....	.....	.....	.....	.....	52	1,291	.....
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	137	.....	.....
Egypt	.....	.....	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Algeria and Tunis	581	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	.....	1,203	124	.....	.....	.....	.....	.....	216	165	163	.....	.....
Other Portuguese Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	259	.....
TOTALS, AFRICA	$26,014	$25,137	$3,057	$54	228	$1,150	1,557	$967	312	$237	$3,557	$2,588	$1,517
GRAND TOTALS	$151,601	$140,092	$47,146	$99,475	52,108	$103,809	88,986	$71,447	318,216	$257,386	$49,437	$130,283	$59,748

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	January, 1924 Pounds	January, 1924 Value	Ten Months Ended January, 1924 April-January Pounds	Ten Months Ended January, 1924 April-January Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom	959,840	$268,894	3,616,639	$1,116,705
United States	2,346,409	600,529	15,259,991	4,201,462
Belgium	.....	.....	.....	.....
Brazil	.....	.....	.....	.....
British East Indies:				
Ceylon	.....	.....	.....	.....
Straits Settlements	44,800	11,720	3,784,772	1,110,777
Dutch East Indies	.....	.....	202,112	52,102
France	.....	.....	4,624	1,163
Other countries	.....	.....	116,052	27,536
Totals	3,351,049	$881,143	22,984,190	$6,509,745
Rubber recovered	270,997	23,114	2,194,143	207,831
Rubber, powdered and rubber or gutta percha scrap	131,035	8,128	2,825,598	103,476
Balata	.....	.....	7,079	6,196
Rubber substitutes	118,906	25,117	686,783	126,571
Totals, unmanufactured	3,871,987	$937,502	28,697,793	$6,953,819
PARTLY MANUFACTURED				
Hard rubber sheets and rods	10,978	7,734	97,613	65,082
Hard rubber tubes	.....	.....	.....	16,715
Rubber thread, not covered	9,538	10,210	68,085	75,580
Totals, partly manufactured	20,516	$17,944	165,698	$157,377
MANUFACTURED				
Belting	.....	$7,997	.....	$119,711
Hose	.....	6,996	.....	103,741
Packing	.....	4,173	.....	40,492
Boots and shoes—*pairs*	16,242	20,207	125,985	178,023
Clothing, including waterproofed	.....	16,175	.....	151,767
Gloves	.....	1,696	.....	14,121
Hot water bottles	.....	2,902	.....	22,059
Tires, solid—*number*	609	7,646	20,403	75,395
Tires, pneumatic—*number*	1,362	29,450	66,632	703,934
Inner tubes—*number*	10,449	7,473	32,520	48,893
Elastic round or flat	.....	18,598	.....	230,014
Mats and matting	.....	317	.....	15,503
Cement	.....	1,893	.....	37,558
Other rubber manufactures	.....	111,240	.....	1,195,718
Totals, manufactured	.....	$236,763	.....	$2,936,929
Totals, rubber imports	.....	$1,192,209	.....	$10,048,125

Exports of Domestic and Foreign Rubber Goods

	January, 1924 Produce of Canada Value	January, 1924 Re-exports of Foreign Goods Value	Ten Months Ended January, 1924 April-January Produce of Canada Value	Ten Months Ended January, 1924 April-January Re-exports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber	$3,340	$17,140	$48,702	$63,809
Totals, unmanufactured	$3,340	$17,140	$48,702	$63,809
MANUFACTURED				
Belting	$28,399	.....	$213,394	.....
Canvas shoes with rubber soles	110,933	.....	966,616	.....
Boots and shoes	83,743	.....	565,854	.....
Clothing, including waterproofed	385	.....	14,301	.....
Hose	10,759	.....	112,621	.....
Tires, casings	481,452	.....	4,788,224	.....
Inner tubes	61,392	.....	515,111	.....
Pneumatic	.....	.....	.....	.....
Solid	35,407	.....	126,251	.....
Vehicle	.....	$1,236	.....	$8,462
Other rubber manufactures	16,722	1,862	214,664	31,793
Totals, manufactured	$829,192	$3,098	$7,517,036	$40,255
Totals, rubber exports	$832,532	$20,238	$7,565,738	$104,064

British Malaya Rubber Exports

An official cablegram from Singapore states that the gross exports of rubber from British Malaya in the month of March amounted to 22,294 tons. The amount of rubber imported was 8,269 tons, so that net exports amounted to 14,025 tons as compared with 18,538 tons in the corresponding month of last year.

The following are the comparative statistics:

	1923 Gross Tons Export	1923 Net Tons Export	1924 Gross Tons Export	1924 Net Tons Export
January	22,871	18,513	23,848	14,981
February	19,907	15,818	19,395	11,955
March	23,646	18,538	22,294	14,025
Total	66,424	52,869	65,537	40,961

United States Crude and Waste Rubber Imports for 1924 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Total 1924	Total 1923	Balata	Miscellaneous	Waste
January—*tons*	20,611	731	181	88	.....	.....	21,611	31,197	23	249	95
February	29,977	1,501	192	93	.....	.....	31,763	24,220	47	799	53
March	16,009	980	663	33	67	.....	17,752	33,916	86	98	184
Totals, 3 months, 1924—*tons*	66,597	3,212	1,036	214	67	.....	71,126	.....	156	1,146	332
Totals, 3 months, 1923	82,842	4,719	1,599	173	.....	.....	.....	89,333	213	1,392	1,929

Compiled from statistics supplied by the Rubber Association of America, Inc.

United States by Countries During February, 1924—*Continued*

Pneumatic Casings			Solid Tires		Pneumatic Tubes			Tire Repair Materials	Hard Rubber Goods			Rubber Water Bottles and Fountain Syringes	Other Druggists' Rubber Sundries	Bathing Caps	Rubber Toys, Balls and Balloons
Automobile		Others	Automobile and Motor Truck	Others	Automobile		Others		Battery Jars and Accessories	Other Electrical Supplies	Others				
Number	Value	Value	Value	Value	Number	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
3,048	$37,973	.....	$19,892	$393	676	$1,593	.....	$1,471	.....	.....	$54	.....	$5,600	.....	$607
14	274	$17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
26	199	.....	330	153	.....	.....	.....	.....	12	.....	.....	.....	.....	.....	.....
1,456	21,277	335	9,277	.....	1,752	2,691	.....	933	.....	.....	.....	$15	1,830	$42	.....
37	388	.....	.....	.....	20	43	.....	.....	.....	.....	.....	.....	15	.....	.....
4,581	$60,111	$352	$29,499	$546	2,448	$4,327	.....	$2,404	$12	.....	$54	$15	$7,445	$42	$607
100	$1,445	.....	.....	.....	200	$425	.....	.....	.....	.....	.....	.....	.....	.....	$117
1,703	22,775	.....	$1,995	$4	733	1,577	.....	$229	$807	.....	.....	$1,037	$739	$201	644
290	2,613	.....	.....	.....	64	95	.....	861	.....	.....	.....	.....	.....	.....	35
101	1,426	.....	630	.....	26	41	.....	.....	.....	.....	.....	.....	.....	.....	.....
39	436	.....	689	1,479	34	48	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
66	722	$21	97	.....	82	123	$4	.....	.....	.....	.....	.....	.....	.....	.....
37	321	.....	.....	.....	106	208	.....	.....	.....	.....	.....	.....	.....	.....	42
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	406
2,336	$29,738	$21	$3,411	$1,483	1,245	$2,517	$4	$1,090	$807	.....	.....	$1,037	$739	$201	$1,244
89,448	$1,043,452	$9,957	$240,283	$21,478	94,222	$166,088	$3,078	$34,208	$15,207	$6,163	$19,706	$17,050	$73,638	$54,570	$68,262

United Kingdom Rubber Statistics

Imports

	February, 1923		February, 1924	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	5,523,100	£326,902	4,485,100	£276,938
Federated Malay States	2,538,800	148,510	2,566,100	158,828
British India	1,022,600	62,296	869,900	54,536
Ceylon and Dependencies	2,546,100	166,010	2,438,500	154,267
Other Dutch Possessions in Indian Seas	183,700	12,170	235,700	14,602
Dutch East Indies (except Other Dutch Possessions in Indian Seas)	935,900	54,403	583,700	35,205
Other countries in East Indies and Pacific not elsewhere specified	126,900	9,220	5,700	265
Brazil	985,700	60,955	956,000	48,193
Peru	.....	.....	.....	.....
South and Central America (except Brazil and Peru)	55,500	2,777	1,600	65
West Africa				
French West Africa	11,200	502	346,100	15,907
Gold Coast	5,500	257	5,600	285
Other parts of West Africa	.....	.....	20,600	884
East Africa, including Madagascar	31,300	1,072	48,100	2,362
Other countries	103,900	6,808	159,300	9,682
Totals	14,070,300	£851,882	12,722,000	£772,019
Waste and reclaimed rubber	268,500	4,359	268,800	3,145
Gutta percha and balata	983,200	126,031	1,116,500	168,823
Rubber substitutes	.....	.....	.....	.....
Totals, unmanufactured	15,222,000	£982,272	14,107,300	£943,987
MANUFACTURED				
Boots and shoes...*doz. pairs*	15,894	£ 23,659	18,213	£ 34,503
Tires and tubes				
Pneumatic				
Outer covers	.....	234,686	.....	92,373
Inner tubes	.....	30,412	.....	18,561
Solid tires	.....	13,007	.....	20,586
Other rubber manufactures	.....	65,347	.....	89,425
Totals, manufactured	.....	£367,111	.....	£255,448

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	7,450	£10,821	8,088	£8,728
Rubber substitutes	1,032	2,194	1,114	2,669
Totals, unmanufactured	8,482	£13,015	9,202	£11,397
MANUFACTURED				
Boots and shoes...*doz. pairs*	10,450	£19,794	21,136	£28,368
Tires and tubes				
Pneumatic				
Outer covers	.....	104,025	.....	171,936
Inner tubes	.....	19,949	.....	31,678
Solid tires	.....	24,758	.....	30,278
Other rubber manufactures	.....	229,078	.....	214,881
Totals, manufactured	.....	£197,604	.....	£477,141

Exports—Colonial and Foreign

	February, 1923		February, 1924	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude rubber				
To Russia	.....	.....	.....	.....
Sweden, Norway and Denmark	280,700	£16,515	612,100	£33,891
Germany	449,100	36,143	1,086,900	65,406
Belgium	392,900	25,170	473,700	28,974
France	3,324,600	228,111	4,297,600	246,067
Spain	79,900	5,252	85,600	5,330
Italy	766,400	53,135	1,065,100	62,530
Austria	.....	.....	1,500	83
Hungary	.....	.....	22,400	1,283
Other European countries	166,200	14,173	50,400	3,355
United States	7,743,100	526,129	8,122,800	486,177
Canada	846,500	61,637	299,000	20,144
Other countries	23,500	2,594	49,500	3,311
Totals	14,122,900	£968,859	16,166,600	£956,551
Waste and reclaimed rubber	26,400	127	7,400	147
Gutta percha and balata	95,700	15,735	127,800	10,088
Rubber substitutes	.....	.....	.....	.....
Totals, unmanufactured	14,245,000	£984,721	16,301,800	£966,786
MANUFACTURED				
Boots and shoes...*doz. pairs*	27	£131	235	£804
Tires and tubes				
Pneumatic				
Outer covers	.....	21,304	.....	51,585
Inner tubes	.....	3,090	.....	1,996
Solid tires	.....	1,607	.....	1,013
Other rubber manufactures	.....	2,130	.....	5,258
Totals, manufactured	.....	£28,262	.....	£60,656

Imports of Crude Rubber Into the United States by Customs Districts

	February, 1923		February, 1924	
	Pounds	Value	Pounds	Value
Buffalo	740	$236	430	$126
Massachusetts	1,579,241	480,825	2,002,636	483,591
Rochester	15	5	.....	.....
New York	57,669,180	12,430,580	65,606,696	16,455,171
Maryland	577,954	94,152	.....	.....
Los Angeles	.....	.....	2,759,253	647,880
San Francisco	281,120	79,388	208,480	54,506
Colorado	271,040	65,637	.....	.....
Oregon	.....	.....	11,200	2,890
Totals	60,379,290	$13,150,823	70,588,695	$17,644,164

EXPORTS FROM THE UNITED STATES OF CANVAS RUBBER-SOLED footwear increased 27.3 per cent during 1923 as compared with 1922, the number of pairs increasing from 2,977,627 to 3,791,018.

Crude Rubber Arrivals at New York as Reported by Importers

Parás and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
MARCH 22. By "Stephen," Pará.					
H. A. Astlett & Co.	161	15	2	...	...
Paul Bertuch	961*	...	...	...	...
General Rubber Co.	76	...	51	4	...
L. Littlejohn & Co., Inc.	244	...	62	135	...
Meyer & Brown, Inc.	...	...	...	367	...
Poel & Kelly, Inc.	196	34	75	161	...
MARCH 23. By "Mongolia," Antwerp.					
Meyer & Brown, Inc.	¶1,202	...	...	...	...
MARCH 26. By "Boswell," Pará.					
H. A. Astlett & Co.	68	7	6	28	...
H. A. Astlett & Co.	‡146	...	‡220	...	...
Paul Bertuch	...	...	...	94	...
Poel & Keily, Inc.	28	...	66	...	...
APRIL 8. By "Hubert," Manaos and Iquitos.					
H. A. Astlett & Co.	16	...	...	...	...
H. A. Astlett & Co.	‡366	...	‡146	...	...
General Rubber Co.	87	16	37	294	...
L. Littlejohn & Co., Inc.	240	24	203	353	...
Meyer & Brown, Inc.	¶872	...	...	138	...
Poel & Kelly, Inc.	276	17	48	170	...
Ultramares Corp.	13	...	5	95	...
APRIL 18. By "Denis," Brazil.					
General Rubber Co.	73	6	4	3	...

*Biscuits. ‡Washed and dried in Brazil. ¶Fine and medium.

Plantations

MARCH 19. By "President Van Buren," London.

F. R. Henderson & Co., Inc.	92 cases
Poel & Kelly, Inc.	160 cases
Chas. T. Wilson Co., Inc.	121 cases

MARCH 21. By "Mississippi," London.

H. A. Astlett & Co.	20 cases
Paul Bertuch	222 cases
L. Littlejohn & Co., Inc.	1,527 cases
Chas. T. Wilson Co., Inc.	166 cases

MARCH, 22. By "Blydendyk," Rotterdam.

Meyer & Brown, Inc.	227 cases

MARCH 22. By "Olen," Bordeaux.

H. A. Astlett & Co.	273 cases

MARCH 23. By "Mongolia," London.

H. A. Astlett & Co.	3 cases
Vernon Metal & Produce Co., Inc.	121 cases

MARCH 23. By "Vallavia," London.

H. A. Astlett & Co.	124 cases
I. T. Johnstone & Co., Inc.	204 cases
L. Littlejohn & Co., Inc.	873 cases
Poel & Kelly, Inc.	1,369 cases

MARCH 24. By "Heffron," Far East.

H. A. Astlett & Co.	325 cases
Baird Rubber & Trading Co., Inc.	280 cases
General Rubber Co.	6,100 cases
F. R. Henderson & Co., Inc.	246 cases
L. Littlejohn & Co., Inc.	5,541 cases
Meyer & Brown, Inc.	225 cases
H. Muehlstein & Co., Inc.	38 cases
Poel & Kelly, Inc.	315 cases
Vernon Metal & Produce Co., Inc.	105 cases
Chas. T. Wilson Co., Inc.	354 cases

MARCH 24. By "Vasconia," London.

H. A. Astlett & Co.	*70 cases
Vernon Metal & Produce Co., Inc.	*65 cases

MARCH 25. By "Athenia," London.

I. T. Johnstone & Co., Inc.	140 cases
Meyer & Brown, Inc.	260 cases
Poel & Kelly, Inc.	1,380 cases

MARCH 25. By "Fairfield City," Far East.

H. A. Astlett & Co.	170 cases
H. A. Astlett & Co.	*112 cases
Baird Rubber & Trading Co., Inc.	1,062 cases
General Rubber Co.	2,260 cases
Hood Rubber Co.	694 bales
Hood Rubber Co.	694 cases
L. Littlejohn & Co., Inc.	5,644 cases
H. Muehlstein & Co., Inc.	234 cases
Poel & Kelly, Inc.	3,055 cases
Fred Stern & Co., Inc.	130 cases
Vernon Metal & Produce Co., Inc.	240 cases
Chas. T. Wilson Co., Inc.	1,463 cases

MARCH 27. By "President Harrison," Far East.

H. A. Astlett & Co.	616 cases
Baird Rubber & Trading Co., Inc.	320 cases
Paul Bertuch	150 cases
Fisk Rubber Co.	4,120 cases
Hood Rubber Co.	85 bales
Hood Rubber Co.	*39 bales
Hood Rubber Co.	*85 cases
I. T. Johnstone & Co., Inc.	393 cases
L. Littlejohn & Co., Inc.	2,440 cases
Meyer & Brown, Inc.	135 cases
H. Muehlstein & Co., Inc.	72 cases
Poel & Kelly, Inc.	1,019 cases
Fred Stern & Co., Inc.	260 cases
Vernon Metal & Produce Co., Inc.	440 cases
Chas. T. Wilson Co., Inc.	574 cases
Chas. T. Wilson Co., Inc.	*36 cases

MARCH 28. By "Moriaka Maru," Far East.

Baird Rubber & Trading Co., Inc.	1,286 cases
Paul Bertuch	112 cases
General Rubber Co.	1,250 cases
L. Littlejohn & Co., Inc.	168 cases
Meyer & Brown, Inc.	560 cases
Vernon Metal & Produce Co., Inc.	56 cases

MARCH 29. By "Maryland," London.

General Rubber Co.	981 cases
F. R. Henderson & Co., Inc.	138 cases
I. T. Johnstone & Co., Inc.	373 cases
L. Littlejohn & Co., Inc.	1,748 cases
Meyer & Brown, Inc.	3,988 cases

MARCH 29. By "West Gotoniska," Far East.

H. A. Astlett & Co.	509 cases
Baird Rubber & Trading Co., Inc.	442 cases
Baird Rubber & Trading Co., Inc.	*†29 cases
F. R. Henderson & Co., Inc.	1,033 cases
I. T. Johnstone & Co., Inc.	255 cases
Meyer & Brown, Inc.	937 cases
H. Muehlstein & Co., Inc.	575 cases
Poel & Kelly Inc.	†58 bags
Fred Stern & Co., Inc.	1,575 cases
Vernon Metal & Produce Co., Inc.	20 cases
Chas. T. Wilson Co., Inc.	350 cases

MARCH 30. By "Lambs," Far East.

L. Littlejohn & Co., Inc.	4,079 cases
Poel & Kelly, Inc.	1,405 cases

MARCH 31. By "M. S. Dollar," Far East.

Baird Rubber & Trading Co., Inc.	112 cases
Fisk Rubber Co.	340 cases
General Rubber Co.	777 cases
Meyer & Brown, Inc.	195 cases
H. Muehlstein & Co., Inc.	644 cases
Poel & Kelly, Inc.	1,356 cases
L. Littlejohn & Co., Inc.	2,380 cases
Fred Stern & Co., Inc.	185 cases
Vernon Metal & Produce Co., Inc.	50 cases
Chas. T. Wilson Co., Inc.	1,908 cases

APRIL 2. By "American Trader," London.

F. R. Henderson & Co., Inc.	52 cases

APRIL 2. By "Napierian," Antwerp.

H. A. Astlett & Co.	204 cases

APRIL 4. By "London Commerce," London.

L. Littlejohn & Co. Inc.	5,337 cases
Meyer & Brown, Inc.	1,012 cases
H. Muehlstein & Co., Inc.	1,120 cases
Poel & Kelly, Inc.	397 cases

APRIL 4. By "Peleus," Far East.

H. A. Astlett & Co.	2,345 cases
Baird Rubber & Trading Co., Inc.	2,180 cases
Paul Bertuch	362 cases
General Rubber Co.	1,161 cases
F. R. Henderson & Co., Inc.	188 cases
Adolph Hirsch & Co.	150 cases
Hood Rubber Co.	*250 cases
Hood Rubber Co.	*450 bales
I. T. Johnstone & Co., Inc.	823 cases
L. Littlejohn & Co., Inc.	11,388 cases
Meyer & Brown, Inc.	2,209 cases
H. Muehlstein & Co., Inc.	1,185 cases
Poel & Kelly, Inc.	3,864 cases
F. R. Henderson & Co., Inc.	541 cases
Vernon Metal & Produce Co., Inc.	1,047 cases
Chas. T. Wilson Co., Inc.	1,694 cases

APRIL 5. By "Lepanto," Far East.

Baird Rubber & Trading Co., Inc.	246 cases
Paul Bertuch	56 cases
L. Littlejohn & Co., Inc.	950 cases
Meyer & Brown, Inc.	1,665 cases
H. Muehlstein & Co., Inc.	328 cases

APRIL 6. By "Gaelic Prince," Far East.

H. A. Astlett & Co.	265 cases
Baird Rubber & Trading Co., Inc.	200 cases
General Rubber Co.	500 cases
F. R. Henderson & Co., Inc.	39 cases
Hood Rubber Co.	*180 bales
I. T. Johnstone & Co., Inc.	476 cases
L. Littlejohn & Co., Inc.	6,452 cases
Meyer & Brown, Inc.	1,120 cases
H. Muehlstein & Co., Inc.	1,045 cases
Poel & Kelly, Inc.	1,967 cases
Fred Stern & Co., Inc.	2,132 cases
Vernon Metal & Produce Co., Inc.	350 cases
Chas. T. Wilson Co., Inc.	1,220 cases

APRIL 6. By "Hyson," Far East.

H. A. Astlett & Co.	1,587 cases
Baird Rubber & Trading Co., Inc.	1,450 cases
Baird Rubber & Trading Co., Inc.	*250 cases
F. R. Henderson & Co., Inc.	22 cases
Adolph Hirsch & Co.	50 cases
Hood Rubber Co.	*89 bales
L. Littlejohn & Co., Inc.	9,617 cases
I. T. Johnstone & Co., Inc.	1,471 cases
Meyer & Brown, Inc.	67 cases
H. Muehlstein & Co., Inc.	840 cases
Poel & Kelly, Inc.	2,503 cases
Fred Stern & Co., Inc.	473 cases
Vernon Metal & Produce Co., Inc.	730 cases
Chas. T. Wilson Co., Inc.	1,013 cases

APRIL 7. By "Bloemfontein," Far East.

Baird Rubber & Trading Co., Inc.	56 cases
Paul Bertuch	168 cases
I. T. Johnstone & Co., Inc.	689 cases
L. Littlejohn & Co., Inc.	1,274 cases
Meyer & Brown, Inc.	1,093 cases
H. Muehlstein & Co., Inc.	367 cases
Poel & Kelly, Inc.	350 cases
Vernon Metal & Produce Co., Inc.	168 cases
Chas. T. Wilson Co., Inc.	140 cases

APRIL 7. By "Maine," London.

Paul Bertuch	27 cases
General Rubber Co.	159 cases
L. Littlejohn & Co., Inc.	532 cases

APRIL 7. By "Valacia," London.

Paul Bertuch	103 cases
General Rubber Co.	1,132 cases
L. Littlejohn & Co., Inc.	1,882 cases
Vernon Metal & Produce Co., Inc.	270 cases
Chas. T. Wilson Co., Inc.	50 cases

APRIL 8. By "Cameronia," Far East.

General Rubber Co.	559 cases
L. Littlejohn & Co., Inc.	482 cases

APRIL 10. By "Clan McNab," Far East.

L. Littlejohn & Co., Inc.	960 cases
Poel & Kelly, Inc.	60 cases

APRIL 10. By "Yantsze," Far East.

H. A. Astlett & Co.	579 cases
H. A. Astlett & Co.	*225 cases
Baird Rubber & Trading Co., Inc.	3,747 cases
General Rubber Co.	4,191 cases
I. T. Johnstone & Co., Inc.	972 cases
L. Littlejohn & Co., Inc.	10,136 cases
Meyer & Brown, Inc.	1,977 cases
H. Muehlstein & Co., Inc.	3,421 cases
Poel & Kelly, Inc.	4,923 cases
Fred Stern & Co., Inc.	1,067 cases
Chas. T. Wilson Co., Inc.	1,478 cases

APRIL 11. By "Colorado," Far East.

H. A. Astlett & Co.	2,717 cases
H. A. Astlett & Co.	*106 cases
Baird Rubber & Trading Co., Inc.	3,150 cases
F. R. Henderson & Co., Inc.	261 cases
F. R. Henderson & Co., Inc.	*11 cases
Hood Rubber Co.	*218 bales
I. T. Johnstone & Co., Inc.	8,727 cases
L. Littlejohn & Co., Inc.	3,355 cases
Meyer & Brown, Inc.	1,280 cases
H. Muehlstein & Co., Inc.	250 cases
Poel & Kelly, Inc.	1,996 cases
Fred Stern & Co., Inc.	524 cases
Vernon Metal & Produce Co., Inc.	1,230 cases
Chas. T. Wilson Co., Inc.	951 cases

APRIL 11. By "Darian," Liverpool.

Paul Bertuch	29 cases

APRIL 11. By "Kendal Castle," Far East.

Baird Rubber & Trading Co., Inc.	260 cases
General Rubber Co.	1,512 cases
Hood Rubber Co.	*415 bales
L. Littlejohn & Co., Inc.	2,300 cases
Meyer & Brown, Inc.	275 cases
H. Muehlstein & Co., Inc.	81 cases
Poel & Kelly, Inc.	2,121 cases
Fred Stern & Co., Inc.	552 cases
Chas. T. Wilson Co., Inc.	252 cases

APRIL 11. By "Muncaster Castle," Far East.

H. A. Astlett & Co.	730 cases
J. T. Johnstone & Co., Inc.	629 cases
Baird Rubber & Trading Co., Inc.	955 cases
General Rubber Co.	3,914 cases
L. Littlejohn & Co., Inc.	7,285 cases
Meyer & Brown, Inc.	1,067 cases
H. Muehlstein & Co., Inc.	930 cases
Poel & Kelly, Inc.	2,433 cases
Fred Stern & Co., Inc.	325 cases
Vernon Metal & Produce Co., Inc.	300 cases
Chas. T. Wilson Co., Inc.	1,807 cases

APRIL 11. By "Nile," Far East.

H. A. Astlett & Co.	310 cases
Baird Rubber & Trading Co., Inc.	624 cases
Baird Rubber & Trading Co., Inc.	*760 cases
General Rubber Co.	3,016 cases
F. R. Henderson & Co., Inc.	275 cases
L. Littlejohn & Co., Inc.	2,165 cases
Meyer & Brown, Inc.	1,040 cases
H. Muehlstein & Co., Inc.	100 cases
Poel & Kelly, Inc.	335 cases
Fred Stern & Co., Inc.	100 cases
Vernon Metal & Produce Co., Inc.	420 cases
Chas. T. Wilson Co., Inc.	216 cases

APRIL 12. By "Jeseric," Far East.

Baird Rubber & Trading Co., Inc.	744 cases

*Arrived at Boston. †Penang.

L. Littlejohn & Co., Inc.	558 cases
Meyer & Brown, Inc.	1,004 cases
H. Muehlstein & Co., Inc.	1,027 cases
Poel & Kelly, Inc.	56 cases
Chas. T. Wilson Co., Inc.	972 cases

APRIL 12. By "Langton Hall," Far East.

H. A. Astlett & Co.	1,383 cases
Baird Rubber & Trading Co., Inc.	226 cases
Paul Bertuch	112 cases
F. R. Henderson & Co., Inc.	11 cases
Adolph Hirsch & Co.	50 cases
Hood Rubber Co.	*250 bales
J. T. Johnstone & Co., Inc.	1,210 cases
L. Littlejohn & Co., Inc.	5,902 cases
Meyer & Brown, Inc.	440 cases
H. Muehlstein & Co., Inc.	494 cases
Poel & Kelly, Inc.	2,367 cases
Chas. T. Wilson Co., Inc.	1,406 cases

APRIL 13. By "New Amsterdam," Amsterdam.

Meyer & Brown, Inc.	226 cases

Rubber Latex

APRIL 11. By "Kendal Castle," Far East.

General Rubber Co.	134,328 pounds

APRIL 11. By "Nile," Far East.

General Rubber Co.	258,339 pounds

Africans

MARCH 22. By "Olin," Bordeaux.

Poel & Kelly, Inc.	709 bags

MARCH 25. By "Athenia," Liverpool.

Poel & Kelly, Inc.	1,380 bags

APRIL 1. By "Lancastria," Liverpool.

Poel & Kelly, Inc.	67 bags

APRIL 9. By "Zarembo," Bordeaux.

Poel & Kelly, Inc.	726 bags

APRIL 11. By "La Bourdannais," Bordeaux.

Baird Rubber & Trading Co., Inc.	305 cases

Balata

APRIL 7. By "Matura," Ciudad.

Ultramares Corp.	98 bales

APRIL 8. By "Hubert," Manãos.

H. A. Astlett & Co.	145 cases
Paul Bertuch	2 cases

Centrals

MARCH 21. By "Songelv," Bahia.

H. A. Astlett & Co.	75 cases

Guayule

MARCH 26—APRIL 16. By "Railways," Mexico.

Continental Rubber Co.	3,680 cases

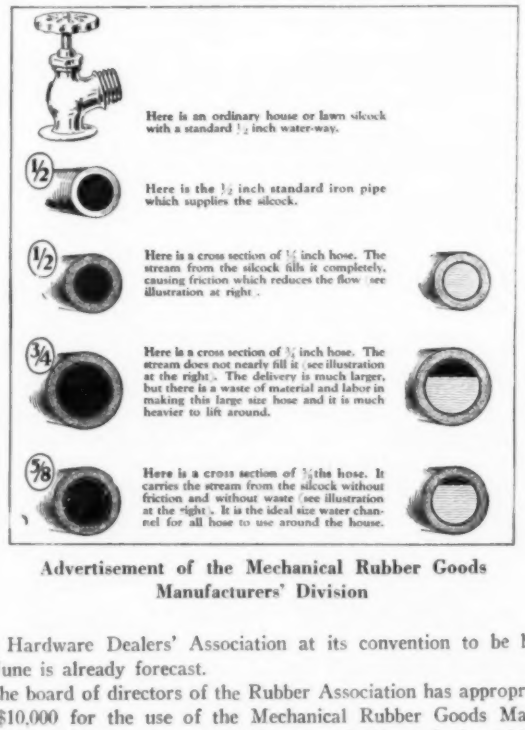
Mechanical Division of the Rubber Association Adopts Standard Garden Hose

The Mechanical Rubber Goods Manufacturers' Division has adopted the 5/8-inch size of garden hose as standard. The National Hardware Association, composed of hardware jobbers, has unanimously approved this standard. Over twenty state retail hardware dealers' associations throughout the country have also endorsed the plan. The approval of the plan by the National Retail Hardware Dealers' Association at its convention to be held in June is already forecast.

The board of directors of the Rubber Association has appropriated $10,000 for the use of the Mechanical Rubber Goods Manufacturers' Division in advertising the adoption of the 5/8-inch size of garden hose as standard. The program contemplates a six months' advertising campaign in the *Hardware Age*, the *Hardware World*, the *Hardware Dealers' Magazine* and possibly the Convention program of the National Retail Hardware Dealers' Association. Approximately 5,000 hardware jobbers and 30,000 hardware dealers located throughout the country will be circularized just prior to the appearance of the first advertisement.

The details of the campaign are being handled by R. E. Conder, sales promotion manager of the Boston Woven Hose & Rubber Co., and the Rubber Association office, under the supervision of the Garden Hose Committee.

Why 5/8-Inch Hose Is Best



Advertisement of the Mechanical Rubber Goods Manufacturers' Division

CARBON BLACK PRODUCTION IN 1922

A report just issued by the U. S. Geological Survey states that the domestic production of carbon black from natural gas in 1922 amounted to 67,795,000 pounds, over 13 per cent more than in 1921. In 1921 and 1922 Louisiana and West Virginia produced more than 90 per cent of the total output. Louisiana maintained first place and increased its lead over West Virginia owing to developments in the Munroe field.

In well informed commercial circles the statement is made that 40 per cent of the carbon black output is consumed in the production of rubber goods, chiefly tires.

SUMMARY OF STATISTICS OF CARBON BLACK, 1921-22

	1921	1922
Number of producers reporting	23	26
Quantity produced, lbs.	59,766,315	67,795,129
Value at plants:		
Total	$5,445,878	$5,819,618
Average per pound, cents	9.1	8.6
Estimated quantity of natural gas used, M cu. ft.	50,565,000	53,629,000
Average yield per M cu. ft., lbs.	1.2	1.3

WORLD COTTON STOCKS DECREASE

Mill stocks of cotton throughout the world were 15.7 per cent less on February 1 this year than on the same date a year ago, while mill consumption of cotton throughout the world in the six months ending January 31, this year, dropped 8.3 per cent below consumption for the same period last year, the International Federation of Master Cotton Spinners reports.

World stocks of cotton in spinners' hands February 1 totaled 4,088,000 running bales, compared with 4,851,000 a year ago. World stocks of American cotton were placed at 2,360,000 bales, compared with 2,804,000 a year ago.

Mill consumption of all cotton for the half year ending January 31 was 10,434,000 running bales. For the same period a year ago consumption totaled 11,384,000 bales, and for the half year which ended July 31, 1923, consumption totaled 10,692,000 bales. Consumption of American cotton for the half year ending January 31 was 5,732,000 bales, compared with 6,662,000 for the same period the year before.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC
GUTTA-PERCHA
Reg U.S.Pat.Off. Reg United Kingdom.

Vol. 70 MAY 1, 1924 No. 2

TABLE OF CONTENTS

Our Publicity Page

Reliability

BABSON'S Reports and Babsoncharts on business conditions, trends and forecasts, issued by Babson's Statistical Organization, Inc., headed by Roger W. Babson at Wellesley Hills, Massachusetts, are well known and highly regarded by leading business men throughout the country. They are based on authoritative statements and statistics secured from many reliable sources and compiled, interpreted and made graphic for ready reference by economic experts for busy executives.

On the reliability of the sources of this information as much as on the ability to read and interpret it rightly depends the remarkable success of the great Babson enterprise, which has been so helpful to American business. Now comes the accompanying letter from the Babson Institute expressing in no uncertain terms the confidence and esteem in which it holds THE INDIA RUBBER WORLD. Could a better recommendation for reliable rubber trade and statistical news be found?

BABSON INSTITUTE
WELLESLEY HILLS, MASSACHUSETTS

December 18, 1923

Business Manager,
The India Rubber World,
25 West 45th Street,
New York, N.Y.

My dear Sir:-

Enclosed please find check for $3.00 for which I shall appreciate being placed upon your mailing list to receive monthly copies of THE INDIA RUBBER WORLD.

Thanking you in this connection in sending me what I consider the best rubber periodical published in this country or abroad, and thanking you for your extreme kindness,

Very sincerely yours,

(Signed) WM. R. DOLTON

It is no secret that the Babson Statistical Organization proposes to devote more detailed attention to the rubber industry than in the past, and THE INDIA RUBBER WORLD is gratified to know that, like most men of authority in all branches of the rubber business, the Babson experts are watching THE INDIA RUBBER WORLD and appreciating its broad scope and reliability.

Reliability is above all else the particular characteristic which has been chiefly responsible for the widespread reading of THE INDIA RUBBER WORLD. Rubber men everywhere, in whatever branch of the business they may be engaged, know that they can depend on it for prompt, accurate and impartial news of every rubber development of moment throughout the world.

THE INDIA RUBBER WORLD properly has its editorial beliefs frankly stated, but they are confined to the editorial pages. Its feature articles and its news columns are invariably free of bias. Propaganda, except for the general good of the rubber trade as a whole, finds no place in its pages. It is a chronicler of the technical and trade progress of its industry, not a promoter for any special interests, groups or branches.

A trade paper such as THE INDIA RUBBER WORLD is read by different persons for various purposes. But whether read for information or for inspiration, its departments, statistics, quotations, reviews and feature articles have all earned for themselves the same enviable reputation for timeliness and accuracy. There is not a rubber company on our subscription list that would not be as superlative in praise as the Babson Institute.